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D. GENERAL BIOLOGY, ETHNOLOGY
AND ANTHROPOLOGY

VOL. VI

FEBRUARY, 1911

No. 1

THE BURIAL MOUNDS OF CAMIGUIN ISLAND.

By MERTON L. MILLER.

(From the *Division of Ethnology, Bureau of Science, Manila, P. I.*)

The Island of Camiguin lies north of the northern end of Luzon, about 55 kilometers distant from Aparri. It is approximately 20 kilometers in extreme length and 12 kilometers in extreme width.

At the time of my arrival on the island, April 17, 1910, there was a population of 90 souls. During my stay of six weeks 30 people arrived from Dalupiri and other neighboring islands with the intention of remaining on Camiguin. Tradition says that there was formerly on the island a population of several thousand, but that the greater part of the people died of cholera between twenty and thirty years ago.

Camiguin is almost entirely covered with forests. If there formerly was a numerous population on it, the clearings which would have been made have become reforested, unless there is some open country of which I did not learn.

The people now living on the island are Ilocanos with the exception of two or three individuals who have come from the Batanes Islands. Some of the Ilocanos were born on Camiguin and some came from the Ilocos Provinces or from the Cagayan Valley. I can not say what the proportion is of native born to immigrants. All the people live within a radius of from 6 to 8 kilometers of the usual landing place at Cadadalman and all are but a short distance from the beach in the harbor of Pio Quinto. A few live at Cadadalman, more at Cadadagatan, a small

valley to the south of Cadadalman, but the majority are at Malatubat, a comparatively large valley which opens out on the other side of a rocky point, north of Cadadalman.

The extinct volcano, known to the natives as Dakelabalai, rises at the extreme southeastern point of Camiguin. There are several places with an area of from 10 to 20 hectares on the southwestern slope of this mountain where there is no vegetation and where there are many openings in the ground which emit sulphurous fumes. On these bare places and on grassy spots just beyond them are numerous artificial heaps of stones. Captain Mitchell, of the Signal Corps of the United States Army, was on Camiguin in the latter part of 1909. He was much interested in these stone piles and opened two or three of them. In the center of each he found a large earthenware jar.

My visit to Camiguin was for the purpose of discovering some clue to the people who buried these jars. The stone piles were found to be from $1\frac{1}{2}$ to 3 meters in diameter and were made up of stones ranging in size from a few centimeters to 50 centimeters in diameter. The mounds rose from 50 to 80 centimeters above the general surface of the ground.

The stones in some cases covered a mound of loose, brown earth mixed with loose stones, in others, a mixture of sulphur and clay, either in the form of a powder, or consolidated into rock, probably by the deposition of sulphur. In the center of each was an earthenware jar. The greater number of these jars were broken, usually so badly that they could not be taken out. The earth in which many of them were embedded was moist and the jars, which appeared to have been poorly baked, were in consequence easily destroyed. They hardened on drying in the air. Those which were embedded in the hardened sulphurous mass in some cases were broken, in others they could not be removed without breaking, while in a few instances it was possible to get them out. A few jars had an inner coating of very delicate crystals of sulphur.

The vessels varied in size from 20 to 60 centimeters in diameter, and in height from 20 to 80 centimeters. Some of them had mouths but little narrower than the greatest width of the jar, while others had small openings, not more than 15 centimeters in diameter. All had originally a cover of some kind over the opening, either an inverted jar or a true cover. Only in the case of one small vessel did I find the cover unbroken, so that I could determine its form. This cover was of almost the same shape as the jar below. The fragments which I found led me to infer that some of the covers had extended about halfway down the side of the body of the jar, being in reality inverted jars; others seemed to have covered the opening of the vessel and to have extended but a short distance beyond the edges.

There can be no doubt that these jars were used for containing the bones of the dead. The merest fragments of bones were found in two

of them, but they were too small to determine what bones they were; a third jar contained a small piece of one of the bones of the skull. In one of the jars were found a few common, pale blue, glass beads together with a piece of dark brown, loosely woven, coarse fabric, which fell to pieces at a touch of the hand. In another jar a few more blue beads of the same kind were seen together with a black, sticky mass which had a very unpleasant odor.

I found it almost impossible to secure any information on the island about the customs of former times, because the people native to Camiguin had all died and the few old people still living had come over from Luzon or from other islands in recent years. The only statement as to the use of these jars which I could secure was from a young man who told me that he had heard an old man say that they formerly buried the dead in earthenware vessels, cutting the legs of the corpse at the knees so as to make it possible, by doubling the legs, to put the entire body into a jar. While this may have been one practice followed, it could not have been the only method of burial, because many of the jars had openings too small to admit the body even of a young child. Of course, it is possible that two methods of burial might have been followed at the same time, one, that of putting the dead body in a jar, and the other, that of placing the bones only in the vessel after the flesh had either been removed or allowed to decay. The presence of the black, sticky mass and the beads in one jar and of the piece of fabric and beads in another would seem to argue for the first method, and the small openings in many of the jars are certainly an argument for the second method.

I made inquiries of many people as to the existence of similar heaps of stones in other parts of the island, but I could learn of none excepting a few on the other side—northeast—of the volcano from those already described. These I visited and examined. They were found to be of the same general style as those to the southwest of the volcano. I was told that at the extreme northern end of the island similar mounds were to be found. However, when I arrived there the guide pointed out certain heaps of stones which on examination proved to be natural outcrops of rock. I believe from what I learned after leaving Camiguin that possibly there are other burial mounds on the island besides those which I saw.

I do not see that there is any reason for concluding that these burials were made by any other people than Filipinos who formerly inhabited Camiguin. Cave burials have been found on at least one island off the northeast coast of Surigao, and others have recently been reported from the Island of Bohol. Burial jars containing bones have also been found in the vicinity of Dapitan, Mindanao.

However, perhaps the most interesting fact in this connection is that I was told that jars similar to those on Camiguin are to be found on Calayan, an island northwest of Camiguin. An old woman who has

lived on Camiguin for the past five years told me that formerly she lived on Calayan and that jars like those found on Camiguin were also found buried on the latter island, but she did not know what purpose they had served nor why they had been buried.

It is to be hoped that some-day evidence will be found which will give a clue to the time when the dead in the Philippines were buried in jars and in caves.

ILLUSTRATIONS.

PLATE I. Dakelabalai Mountain with burial sites in the foreground.

II. Burial mounds near sulphur fumaroles.

III. Burial mound.

IV. Burial mound.

V. Fig. 1. Partly excavated jar buried in a mixture of clay and sulphur.

2. Partly excavated jar buried in a mixture of clay and sulphur.

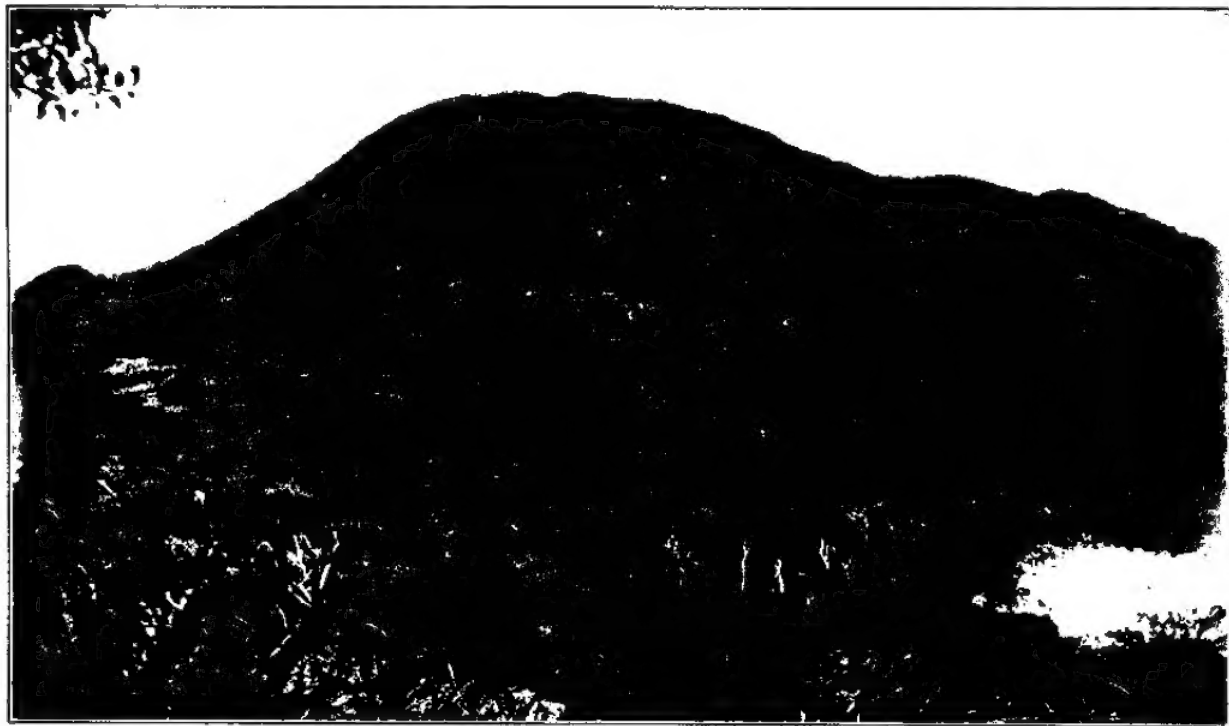


PLATE I.

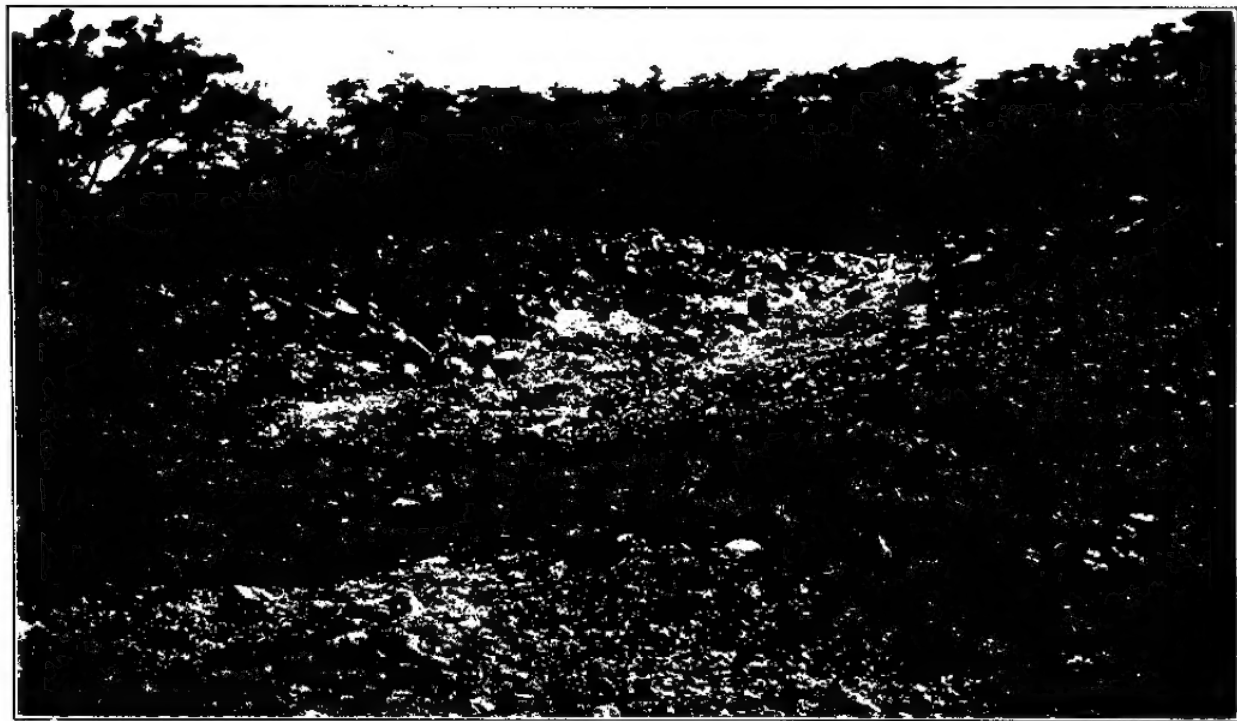


PLATE II.



PLATE III.



PLATE IV.

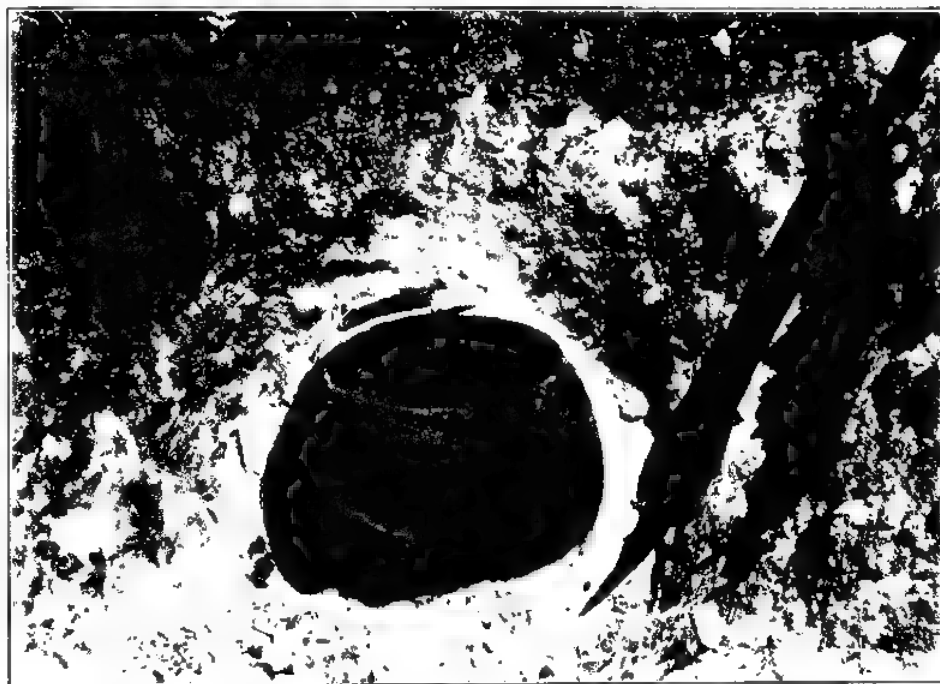


FIG. 1.



FIG. 2

PLATE V.

THE MEN OF CAINTA.

By 'ROBERT BENNETT BEAN and FEDERICO S. PLANTA.

(From the Anatomical Laboratory, Philippine Medical School, Manila, P. I.)

The town of Cainta, a stone's throw from Taytay near the Lake of Bay (Laguna de Bay), is of considerable historic interest because of the many bloody battles fought in its vicinity between the Spaniards and the natives, the Chinese and the natives, and the Spaniards and the Chinese. It is of great interest to the anthropologist because it presents a body of people different from the surrounding population.

Cainta was founded before the Spaniards came to the Islands, according to a statement in a history of the Philippines by Jose Montero y Vidal, who, in the first volume, page 41, affirms that Capitan Juan Salcedo, one of the first Spanish conquerors who came to the Philippines, having in 1571 subdued the natives of Cainta and Taytay first, went to the Lake (La Laguna), pacifying many towns.

There seem to be no data concerning the origin of the inhabitants of Cainta, but one of two suppositions is plausible. Either they are derived from settlers of East Indian origin who arrived before the Spaniards, or else they represent the descendants of a British regiment of East Indian troops who remained when the British evacuated the Philippines in 1763. The history of P. Murillo, written in 1752, volume 7, page 33, speaks of some of the inhabitants of the Philippines, when the Spaniards arrived, as black people, called for politeness' sake *Criollos* (*Criollos* or *Morcos*), who were characterized as very active politically. Murillo believed that these people came from Malabar or Coromandel, belonging to the British, and they were probably of East Indian origin.

P. Juan de Salcedo, in his history, page 264, speaking of these *Morcos* or *Criollos*, says that they have long, straight hair, long noses, and wide open eyes. He speaks further of some similar people from Malabar that he had known in Manila, who married and settled nearby in Santo Tomas and at times came to Manila on business. He also says that if they were not known as natives of the Philippines they might be regarded as Europeans, except for their dark skins.

P. Martinez asserts in his *Estadimos de Filipinas*, page 264, that at the beginning of the conquest of the Philippine Islands by the Spaniards there came Moors from Hindustan trading with the natives.

From these statements one may infer that the people of Cainta are of East Indian origin and occupied the town before the arrival of the Spaniards. Current opinion among Filipinos differs in regard to this, although many reliable Filipinos inform me that tradition states their

origin in a different way. A company of East Indian soldiers, stationed at Cainta during the British occupation of Manila, was overlooked when the British embarked and they settled and remained there.

It seems to me that both suppositions may be true. The town of Cainta was originally settled by East Indians, and a few men from among the British troops of East Indian origin remained when the British evacuated Manila.

The inhabitants of Cainta impressed me as being tall, black-skinned, long-nosed, and open-eyed in contrast with the inhabitants of Taytay who are small, brown-skinned, short-nosed, and not open-eyed. Some of the men I saw in Cainta were more than 180 centimeters in height, and the skin of many was of so dark a brown as to appear black. The face is large and long and the nose is notably high and long, the eyes large, with wide open lids that give the peculiarly attractive expression to the countenance which is often seen among East Indians. Whatever may have been the proximate origin of the people, I believe there can be no doubt as to their Indian origin ultimately.

In any event, they probably settled in Cainta and married Filipinos. Their descendants then resemble both Indians and Filipinos, with probably a preponderance of the former; at least such is the appearance by casual observation, and such is the actual condition as determined by measurements.

The measurements of 38 men of Cainta give average dimensions that are in almost every part slightly different from similar dimensions of the men of Taytay, and the differences are invariably in the direction of the European. The average differences are slight, as may be seen by the accompanying list, but they are significant because they are averages and because all the differences simulate the European.

TABLE I.—Average dimensions—physical characters of adult males at Cainta, greater or less than men of Taytay.

Character	Centi- meters.	Character.	Centi- meters.
Body		Head:	
Stature	+1.43	Maximum length	+0.10
Sitting height	+0.39	Maximum breadth	+0.26
Pubic height	+2.32	Maximum height	+0.13
Umbilical height	1.15	Minimal frontal breadth	+0.01
Sternal height	+1.82	Bizygomatic breadth	+0.27
Chin height	+1.33	Bimastoid breadth	+0.11
Ear height	+1.00	Bigonial breadth	+0.19
Ankle height	+0.18	Naso-buccal distance	0.05
Knee height	+0.59	Naso-alveolar distance	+0.03
Trochanter height	+2.42	Nose height (base)	+0.04
Fingertip height	+0.20	Nose breadth	+0.10
Wrist height	+0.65	Nose length	+0.09
Elbow height	+1.71	Chin nasion distance	+0.20
Acromion height	+2.51	Nasion hair line distance	+0.36

TABLE I.—Average dimensions—physical characters of adult males at Cainta, greater or less than men of Taytay—Continued.

Character.	Centimeters.	Character.	Centimeters.
Head—Continued.		Head—Continued	
Mouth breadth (lips).....	-0.15	Eye length (transverse).....	+0.07
Mouth length.....	+0.10	Frontal circumference.....	0.00
Ear breadth.....	-0.01	Parietal circumference.....	-0.29
Ear length.....	-0.05	Forehead circumference.....	-0.10
Ear cartilage length.....	+0.14	Occipital circumference.....	0.38
Interocular distance.....	-0.08		

It is to be reckoned that the indices and relative factors will also differ between the two groups of men because the actual measurements are different, and such is the case, as may be seen by the following list, all pointing to the European origin of the Cainta Indians.

TABLE II.—Men of Cainta, indices, and relative factors, greater or less than men of Taytay.

Factors.	Centimeters.	Factors.	Centimeters.
Indices:		Relative lengths:	
Omphalic.....	-2.75	Lower leg.....	+0.23
Nasal.....	-2.40	Upper leg.....	+0.60
Cephalic.....	-1.39	Hand.....	+0.05
Physiognomie.....	-0.20	Forearm.....	+0.65
Morphologic.....	+1.40	Upper arm.....	-0.30
Brachial.....	+3.80		

In only one index, the brachial, does the Cainta Indian resemble other people than the European, and this index is like that of the Negro. It is also the most distinctive characteristic of the body parts of the Negro. There is then evidence of Negro mixture in the Cainta Indians, more than in the Filipinos of Taytay.

The individuals, more than the average, show distinctive European markings. One indication of European extraction for the Cainta men is the presence of a relatively large number of Iberians, more than one third of the total number measured. The Iberians of Cainta also appear to be purer than the Iberians of other parts of the Philippines. Take for instance No. 15 with a stature of 163.6 centimeters, nasal index 77.7, cephalic index 75.9, and omphalic index 35.9, almost a typical Iberian. The face is long and narrow, the body is short, and the legs are long, all Iberian characteristics. Notice may also be taken of the three men in the plate accompanying this article, who represent Iberians of type B in figure 1, type A in figure 2, and type C in figure 3. Front and

TABLE I.I.—Men

Type of individual.	Age.	Serial number.	Clinical number.	Body.									
				Stature	Sitting height.	Pubic height.	Unilical height.	Sternal height.	Chin height.	Ear height.	Ankle height.	Knee height.	Tr. scapular height.
Iberian	42	1		159.0	85.3	80.0	91.0	129.8	137.8	146.8	7.8	43.5	81.6
Alpine	45	2	375	150.5	81.4	76.5	86.7	118.5	125.7	136.6	7.7	42.0	71.5
Blend	19	3	371	176.3	89.2	85.2	103.8	143.3	149.7	160.1	7.4	50.2	95.4
Blend	55	4	479	167.3	84.3	80.6	92.6	124.8	133.0	142.8	5.8	41.0	81.0
Blend	62	5		146.1	80.9	74.0	86.3	119.0	123.5	134.5	6.0	39.2	70.0
Blend	39	6		161.0	84.7	82.6	96.3	130.3	138.7	148.9	7.0	45.2	84.7
Alpine	28	7		161.5	83.0	83.6	98.5	131.0	137.0	147.7	6.5	44.5	85.0
Blend	25	8		161.0	80.0	87.5	105.0	133.0	138.0	148.0	6.4	47.0	88.0
Blend	29	9		160.0	86.0	81.0	97.0	130.3	134.5	145.0	7.0	45.5	84.5
Australoid	33	10		166.0	84.5	87.4	101.3	134.0	142.0	152.0	6.8	46.6	89.0
Iberian	20	11		169.4	85.0	91.0	104.0	139.0	145.5	157.0	7.1	48.7	90.8
Blend	15	12		154.0	82.0	98.0	93.0	126.0	131.0	139.0	6.3	42.5	80.0
Blend	17	13		164.0	86.5	84.5	97.6	134.0	141.0	152.0	7.8	43.7	85.4
Blend	25	14		169.0	84.3	89.0	104.0	140.0	148.0	156.0	6.8	47.5	91.0
Iberian	25	15		163.6	81.0	87.0	99.7	135.0	141.6	151.5	7.1	44.3	91.0
Australoid	19	16		165.0	86.5	85.0	100.0	137.0	144.5	152.8	7.2	44.0	87.3
Blend	30	17		167.0	85.0	88.0	102.5	137.0	143.3	153.6	7.5	46.0	93.0
Australoid	56	18		161.2	76.3	85.0	99.5	130.3	139.0	149.0	5.6	45.2	86.0
Iberian	65	19		167.0	81.6	80.8	92.5	128.2	134.3	145.2	6.5	43.6	83.6
Blend	30	20		158.5	83.2	78.5	93.8	128.6	135.7	145.5	6.4	45.1	83.7
Blend	16	21		152.5	76.0	81.0	92.6	123.0	128.5	136.5	6.2	42.5	82.0
Australoid	37	22		158.0	84.0	79.0	93.0	128.0	132.0	144.0	6.2	42.0	83.0
Blend	17	23		165.6	83.0	81.5	92.0	124.5	131.0	142.0	6.0	43.0	80.5
Australoid	35	24		157.0	83.0	82.0	95.0	126.0	135.0	144.0	4.8	44.0	82.0
Blend	60	25		160.0	83.0	81.0	97.0	129.0	133.0	145.0	6.8	46.0	87.0
Blend	18	26		(?)	83.0	77.0	94.5	126.0	133.0	142.0	5.8	40.0	80.5
Blend	17	27		161.0	81.0	84.0	96.0	133.0	137.0	147.0	6.0	43.0	86.5
Australoid	16	28		155.0	84.0	79.0	92.0	125.5	132.0	142.0	5.8	44.0	82.0
Blend	38	29		159.0	84.0	81.0	95.3	127.0	136.7	145.5	6.8	45.0	81.2
Australoid	19	30		166.5	87.5	89.0	104.0	135.5	142.3	152.6	6.8	46.5	90.0
Blend	34	31		151.6	82.0	79.0	89.0	124.0	128.0	140.0	8.7	42.0	82.0
Blend	43	32		162.0	86.5	82.5	95.0	131.0	141.0	149.3	6.2	43.0	86.0
Blend	26	33		163.5	85.5	86.6	99.5	133.0	140.6	151.6	7.2	47.0	87.6
Iberian	48	34		164.8	86.0	86.0	100.0	135.0	142.0	152.5	7.1	47.0	89.0
Iberian	58	35		169.0	85.5	91.0	103.0	139.5	144.0	155.8	8.3	48.5	94.0
Australoid	39	36		161.5	84.8	82.6	97.4	131.5	136.8	147.0	6.5	42.4	85.0
Alpine	47	37		159.0	82.7	88.2	96.0	129.0	135.5	146.0	6.8	48.5	87.0
Iberian	25	38		160.0	86.8	89.5	104.0	133.0	145.5	155.0	7.3	48.0	93.0
General average				160.9	83.6	84.1	96.9	130.7	137.6	147.1	6.7	44.7	85.5

of Cainta, Rizal.

Head.

Maximum length.	Minimum breadth.	Maximum height.	Forehead width.	Byzomatic.	Blindfold.	Rignonae.	Naso buccal.	Naso alveolar.	Naso base.	Nasion half line.	Chin nasion.	Nose width.	Nose length.	Mouth width.	Mouth length.	Ear width.	Ear length.	Interocular distance.	Eye length both eyes.	Eye cor.	Frontal circumference.	Parietal circumference.	Forehead circumference.	Occipital circumference.	Ear cartilage.
180	14.2	12.5	10.7	13.0	12.5	10.6	7.9	6.3	8.0	6.8	11.5	3.6	4.7	2.2	5.1	3.4	5.6	3.0	6.2	1.5	30.0	35.0	26.0	29.8	4.5
175	14.8	12.0	10.4	13.6	12.3	10.9	6.9	6.7	2.7	6.4	11.5	3.7	5.1	1.8	4.9	3.3	5.6	3.4	5.7	2.5	31.8	34.2	27.7	27.6	4.5
174	14.7	12.2	10.2	13.6	13.5	11.0	7.4	6.5	3.2	7.0	12.2	4.2	5.0	2.6	4.3	3.8	6.4	3.4	6.8	3.0	32.3	36.2	27.0	29.5	5.4
183	14.9	12.2	9.9	14.8	13.0	11.4	7.7	6.3	3.1	7.5	10.7	3.7	4.8	1.7	4.7	3.6	6.4	3.1	5.9	2.0	30.4	34.8	27.8	28.0	5.5
181	15.0	12.8	10.8	14.2	13.1	11.0	7.6	6.5	3.2	8.5	11.7	4.5	5.0	1.0	5.0	4.0	7.8	3.3	6.4	3.0	30.6	35.8	28.0	28.7	5.0
185	14.6	12.3	10.8	13.8	13.3	10.3	7.4	7.0	2.7	6.8	11.8	4.1	4.8	1.5	5.1	3.5	6.0	3.6	6.5	3.0	28.8	35.3	27.8	28.2	4.6
182	15.4	13.3	10.0	12.8	12.6	10.4	7.4	7.2	3.0	6.0	12.0	3.6	5.3	2.6	4.8	3.7	5.9	3.1	6.2	5.0	31.0	36.5	27.0	27.0	5.3
180	15.2	11.8	11.5	14.0	12.8	11.3	7.2	6.4	3.0	7.2	11.2	4.0	4.6	2.1	4.6	3.7	6.9	3.6	6.4	2.0	30.8	35.3	28.4	27.5	5.3
178	14.9	13.0	10.0	13.0	12.8	10.2	7.3	6.8	2.0	6.0	12.0	4.1	5.1	2.3	5.0	3.6	6.3	3.0	6.0	3.0	31.0	37.0	26.5	26.5	5.4
163	15.0	12.9	10.7	14.5	13.0	11.0	6.8	6.6	3.0	7.0	11.2	4.8	4.7	2.5	5.4	3.7	6.7	3.7	6.4	4.0	31.7	36.0	28.8	28.8	5.4
180	14.5	11.7	10.1	13.6	13.0	11.3	6.8	6.6	3.8	8.0	11.8	4.0	4.9	2.1	5.2	3.8	6.2	3.2	6.5	5.0	29.0	35.0	26.0	28.5	5.2
176	14.0	12.2	9.6	12.2	12.0	10.5	6.5	5.7	2.2	5.8	10.6	3.8	4.2	2.1	4.8	3.5	6.2	3.3	5.9	3.0	30.0	34.8	26.2	27.0	6.1
182	14.6	12.5	10.4	13.2	12.6	10.5	6.6	6.1	3.2	6.0	11.3	3.8	4.7	2.3	5.0	3.3	5.6	3.1	6.0	1.0	30.5	35.9	26.3	26.4	4.8
176	15.3	12.0	9.7	12.9	13.4	10.1	7.2	6.6	3.1	7.0	11.0	4.2	5.0	2.7	5.3	3.1	5.6	3.0	6.0	3.0	30.0	35.0	26.0	26.0	5.0
187	14.2	12.0	10.2	12.7	12.2	9.7	7.1	6.0	2.8	7.3	11.5	3.5	4.5	1.9	4.5	3.9	6.0	3.2	6.7	3.5	28.6	35.4	25.7	26.6	5.4
187	14.1	12.3	10.7	13.9	12.5	10.2	6.5	6.1	2.8	7.7	11.3	3.8	4.4	1.8	4.3	3.9	6.5	3.6	6.1	1.0	29.9	32.5	28.0	27.8	5.5
189	15.1	13.5	11.1	14.1	12.6	10.1	6.7	5.8	3.5	6.4	11.0	4.0	4.5	2.0	5.1	3.1	6.0	3.7	6.1	3.5	29.8	37.0	26.5	25.7	5.4
183	13.5	12.5	10.2	12.8	12.3	10.4	7.2	6.2	3.1	7.7	11.6	4.4	4.7	1.6	4.8	4.0	6.9	3.2	6.1	3.0	30.8	34.2	27.0	26.4	5.5
187	14.4	12.4	10.0	13.2	13.3	10.2	7.9	7.0	3.6	7.4	12.1	4.6	5.4	1.6	5.5	3.9	6.6	2.7	5.9	3.0	28.6	35.0	26.2	28.0	5.6
186	15.0	13.4	10.4	14.0	13.0	10.4	6.9	6.2	3.0	6.5	12.0	4.0	5.1	1.8	4.7	3.3	6.5	3.6	6.1	1.0	31.0	35.0	26.5	28.5	4.6
182	14.5	12.6	10.4	13.1	13.0	10.3	7.0	6.4	2.7	7.2	10.6	3.8	4.3	2.5	4.5	3.5	6.6	3.8	5.8	3.5	29.0	36.4	26.3	29.0	5.0
200	15.0	13.1	11.3	14.4	13.1	11.1	7.4	6.8	3.1	7.4	12.1	4.1	4.5	2.0	5.4	3.6	6.0	3.4	6.7	3.0	33.0	37.5	29.5	29.5	4.6
178	14.3	12.6	10.6	13.1	12.3	10.3	6.6	6.1	3.0	7.1	10.8	4.1	4.4	2.0	4.7	3.4	6.7	3.6	5.4	1.0	30.6	35.5	27.3	27.3	5.1
187	15.1	12.8	10.5	14.9	15.6	10.5	7.1	6.4	3.0	7.4	10.7	3.7	4.0	1.6	5.2	3.8	6.6	3.4	5.7	3.5	31.0	36.6	27.6	28.7	5.2
190	15.4	13.0	10.8	14.2	13.0	11.0	8.3	7.6	3.1	9.0	13.2	4.3	5.6	1.3	4.8	3.7	6.5	3.5	6.2	4.0	32.0	36.8	29.5	28.0	4.3
180	14.4	12.3	10.5	12.9	12.4	10.0	7.1	6.5	3.2	6.3	11.6	3.0	4.9	1.8	4.2	3.3	5.5	3.0	6.3	2.0	28.8	36.6	26.0	29.0	4.4
182	14.4	12.5	10.3	12.5	12.0	9.8	6.8	6.2	2.7	6.8	10.6	4.0	4.8	1.8	4.5	3.2	6.0	2.6	5.7	3.0	29.0	35.6	27.0	27.8	4.8
183	14.8	13.0	10.7	13.8	13.0	10.3	6.6	6.5	2.7	7.8	10.0	4.1	4.4	2.5	4.1	3.4	6.2	3.4	6.8	2.5	31.7	34.8	28.0	26.6	5.0
183	16.0	12.5	10.5	13.6	12.7	10.3	7.0	6.4	2.6	6.6	11.7	3.7	4.5	2.0	5.1	3.4	5.4	3.1	6.1	3.0	30.0	36.0	28.2	29.6	4.3
187	15.0	12.6	10.8	13.8	13.7	11.2	6.7	6.3	2.7	5.7	11.6	4.1	4.0	2.3	5.2	3.1	6.4	3.8	6.0	3.0	30.7	36.0	28.2	29.6	5.8
184	15.1	12.7	11.2	14.0	12.4	11.0	7.2	6.9	2.7	7.3	11.7	4.2	5.0	2.2	5.2	3.8	6.2	3.5	5.0	3.0	32.0	35.0	28.2	30.0	5.0
191	15.5	12.7	10.7	14.4	14.0	11.0	7.7	7.1	3.2	8.1	13.0	4.8	5.1	2.1	5.0	3.1	5.8	3.2	6.5	3.0	31.0	36.0	29.0	31.0	4.8
178	14.7	12.5	10.4	13.6	12.3	11.0	7.6	6.9	3.0	6.3	12.0	4.0	5.0	2.7	5.4	3.8	5.8	3.4	6.3	3.0	30.2	31.8	28.2	26.2	5.1
190	14.7	12.5	10.2	13.1	12.8	10.0	7.5	6.9	3.3	6.2	12.0	3.5	5.3	1.4	5.2	3.7	6.7	3.2	6.4	3.0	31.0	34.8	23.6	29.6	5.6
186	14.7	12.6	10.2	13.4	12.7	10.7	8.4	7.2	3.3	7.5	12.3	4.2	5.4	2.4	5.2	3.7	6.4	3.4	6.8	3.0	30.4	34.3	28.0	28.2	5.3
200	15.0	13.6	10.5	13.6	12.5	10.0	7.2	6.6	3.1	6.8	11.6	4.0	4.7	2.5	5.0	4.0	6.3	3.8	6.4	3.0	30.0	35.0	28.0	28.0	5.0
172	15.5	12.3	9.6	13.0	12.4	10.5	7.4	6.5	2.5	5.4	12.0	3.8	5.3	1.7	4.7	3.5	5.6	3.3	5.7	3.0	30.0	35.0	28.0	28.0	5.7
182	14.3	12.8	10.3	12.7	13.0	10.0	7.5	6.7	3.0	7.0	11.9	3.8	5.1	2.0	4.8	3.6	6.0	3.6	6.4	3.0	30.0	35.0	28.0	28.0	5.2
184	14.7	12.6	10.4	13.4	12.8	10.5	7.1	6.5	2.9	6.9	11.5	3.9	4.8	2.0	4.9	3.5	6.1	3.3	6.0	3.0	30.5	35.4	27.6	28.1	5.1

TABLE IV.—*Men of Cantá,*

Species	Number	Absolute lower leg length.	Relative lower leg length.	Absolute upper leg length.	Relative upper leg length.	Absolute hand length.	Relative hand length.	Absolute fore-arm length.	Relative fore-arm length.	Absolute upper arm length.	Relative upper arm length.	Pubis to umbilicus.
Iberian	1	37.7	23.7	35.1	22.7	16.2	10.1	23.1	15.7	29.7	18.6	11.0
Iberian	2	34.3	22.7	32.5	21.5	16.2	10.7	21.2	14.0	29.8	19.8	10.9
Blend	3	42.6	24.2	45.2	25.2	20.0	11.3	27.0	15.3	36.0	20.1	13.6
Iberian	4	35.2	22.2	40.6	25.6	17.6	11.1	23.6	15.0	32.6	20.7	12.0
Blend	5	33.2	22.4	35.8	24.1	16.8	11.3	19.7	13.3	31.1	20.0	12.3
Iberian	6	38.2	23.7	38.9	24.1	17.3	10.7	24.3	15.0	33.4	20.7	13.7
Iberian	7	38.0	23.5	40.5	25.0	18.5	11.4	25.0	15.1	32.5	20.1	14.9
Blend	8	40.6	25.2	41.0	25.4	17.2	10.6	25.0	15.5	33.0	20.1	17.5
Blend	9	38.2	23.8	39.3	24.5	18.0	11.2	26.0	16.2	31.0	19.3	16.0
Australoid	10	39.8	23.0	42.4	25.5	19.0	11.4	27.0	16.2	31.4	19.9	14.9
Iberian	11	41.0	24.5	42.1	24.8	19.1	11.2	27.8	16.4	34.1	19.5	14.0
Blend	12	36.2	23.5	37.5	21.3	18.0	11.6	22.0	14.2	29.0	18.8	(?)
Blend	13	35.9	21.8	41.7	25.4	16.5	10.0	23.5	14.3	30.0	21.0	13.1
Blend	14	40.7	24.0	43.5	25.7	19.0	11.5	28.0	16.5	32.9	19.4	15.0
Iberian	15	37.2	22.7	46.7	28.5	20.0	12.2	24.0	14.6	32.2	19.6	12.7
Australoid	16	36.8	22.1	48.3	26.0	16.5	9.9	25.7	15.4	35.6	21.4	15.0
Blend	17	37.5	23.4	48.0	28.7	18.5	11.0	26.5	15.8	33.4	20.0	14.5
Iberian	18	39.6	24.5	40.8	24.3	17.4	10.7	24.2	15.0	33.6	20.8	14.7
Iberian	19	37.1	23.6	40.0	25.4	17.0	10.8	22.6	14.8	32.4	20.6	11.7
Iberian	20	38.7	24.4	38.6	24.3	17.7	11.1	22.5	14.1	36.3	22.2	14.8
Blend	21	36.3	23.8	39.5	25.3	19.0	12.4	23.5	15.4	32.5	21.3	11.6
Australoid	22	35.8	22.6	41.0	25.9	18.0	11.3	23.0	14.5	33.5	21.2	14.0
Blend	23	37.0	23.7	37.5	24.1	16.5	10.6	24.0	15.4	32.0	20.5	10.5
Australoid	24	39.2	24.9	38.0	24.2	20.0	12.7	23.0	14.6	32.8	20.8	13.0
Blend	25	39.2	24.5	41.0	25.6	17.0	10.6	23.0	14.3	28.0	17.5	13.0
Blend	26	34.2	22.2	40.5	24.0	18.0	11.0	23.0	14.0	32.0	20.0	17.0
Blend	27	37.0	22.9	43.5	27.0	17.8	11.0	24.1	14.9	31.7	19.6	12.0
Australoid	28	39.2	24.6	38.0	24.5	18.0	11.6	22.0	14.1	28.8	18.5	13.0
Blend	29	38.2	24.0	36.2	22.7	17.0	10.6	24.0	15.0	30.5	19.1	14.3
Australoid	30	39.7	23.8	43.5	26.1	18.0	10.8	27.5	16.0	34.7	20.6	14.0
Blend	31	33.3	21.9	40.0	26.3	17.7	11.6	22.3	14.6	29.5	19.4	16.0
Iberian	32	37.4	23.0	42.4	26.1	17.5	10.8	24.0	14.8	32.0	19.7	12.5
Iberian	33	39.9	24.3	40.6	24.8	19.2	11.7	25.0	15.2	33.5	20.5	12.3
Iberian	34	39.9	24.2	42.0	25.4	18.0	10.9	25.0	15.1	34.0	20.6	14.0
Iberian	35	40.2	23.7	45.5	26.9	19.5	11.5	25.5	15.0	33.5	19.8	16.0
Australoid	36	39.9	22.2	42.6	26.3	18.0	11.5	23.4	14.4	31.2	19.3	14.8
Alpine	37	41.7	26.2	38.5	24.2	18.6	11.7	26.3	16.5	30.7	19.3	9.8
Iberian	38	40.7	24.0	45.0	26.6	19.1	11.3	26.9	15.9	35.6	21.0	14.5
General average		37.9	23.6	40.75	25.2	18.0	11.1	24.3	15.1	32.1	20.0	13.2

indices and relative factors.

Umbilicus to sternum.	Omphalic index.	Total head height.	Upper face height.	Cephalic index.	Nasal index.	Ear type	Morphologic face index.	Physiognomic face index.
38.8	28.3	21.2	9.7	78.8	70.6	Iberian	88.4	78.0
31.8	32.0	23.8	12.3	84.6	72.6	Iberian	84.5	78.9
34.6	39.4	26.6	14.4	79.9	81.0	Mixed Primitive	89.7	70.8
32.2	37.2	24.3	13.6	81.4	77.1	Iberian C and D	75.5	78.5
32.7	37.6	24.6	12.9	82.9	80.0	B. B. B. Iberian C	82.3	70.2
34.0	40.3	22.3	10.5	78.9	85.4	Iberian A and D	85.5	74.1
32.5	45.8	24.3	12.5	84.6	66.0	Iberian A	92.7	71.1
28.0	62.5	23.0	11.8	84.4	86.9	Mixed Primitive	80.0	76.0
33.3	48.4	25.5	13.5	83.7	81.9	Mixed Iberian B and D	94.6	72.2
32.7	42.5	24.0	12.8	77.7	102.1	Mixed B. B. M., Primitive	77.2	79.6
35.0	37.1	23.9	12.1	77.9	81.6	Mixed	86.7	68.6
33.0	—	23.0	12.5	80.6	90.4	Mixed	85.0	74.8
36.4	35.9	23.0	11.7	80.2	80.8	Iberian A Primitive	85.6	76.3
36.0	41.6	21.0	10.0	87.5	84.0	Iberian B Primitive	85.2	71.6
35.3	35.9	22.0	10.5	75.9	77.7	Primitive	90.5	67.5
37.0	40.5	21.5	10.2	75.4	80.3	Iberian D, Mixed Alpine Primitive	81.3	73.1
34.5	42.0	23.7	12.7	80.3	58.8	Iberian A Primitive	78.0	81.0
30.8	47.0	22.2	10.6	73.8	93.6	Iberian C	90.6	66.3
35.7	32.7	22.7	10.6	77.0	74.6	Iberian A and C	91.6	67.7
35.3	41.9	22.8	10.8	81.0	78.4	Iberian, Mixed	85.7	75.6
30.4	38.1	24.0	13.4	79.7	58.4	Mixed Iberian D subnorthern	80.9	73.6
35.0	40.4	25.0	13.9	75.0	91.1	Iberian mixed	84.0	73.8
32.4	32.3	21.5	10.7	84.4	93.2	Mixed Iberian, Primitive	82.4	73.1
31.0	41.9	22.0	11.3	80.7	85.2	Iberian A, mixed	76.4	77.3
32.0	40.6	27.0	13.8	81.1	76.7	Iberian D, B. B. B.	92.9	68.9
31.5	55.5	—	—	60.0	71.1	Mixed Primitive, Iberian	58.1	72.0
37.0	32.4	24.0	13.4	79.1	83.3	Mixed Primitive subnorthern	84.8	71.8
33.5	38.8	23.0	13.0	80.9	93.2	Mixed Alpine Primitive	72.4	76.9
31.7	46.1	22.3	11.2	87.4	82.2	Odd type, Alpine, Primitive	81.6	76.8
31.6	47.4	13.9	(?)	80.2	102.5	Mixed subnorthern	84.0	79.7
35.0	28.5	23.6	11.9	81.6	84.0	Mixed B. B. B., Primitive Iberian	83.5	73.6
36.0	34.7	21.0	8.0	81.2	74.5	Iberian D, mixed	90.2	68.2
33.5	38.5	23.0	11.5	82.6	80.0	Iberian D and C	88.2	74.3
35.0	40.0	22.8	10.8	75.0	66.0	Mixed Iberian A and D	91.5	71.9
38.5	25.9	25.0	12.7	79.0	77.7	Iberian A and D	91.7	67.6
34.1	43.4	24.7	12.1	75.0	85.1	Mixed B. B. B., Primitive	85.3	73.9
33.6	29.1	23.5	11.5	90.1	71.7	Iberian, mixed	92.3	74.7
31.0	42.6	23.5	11.6	78.6	74.5	Iberian A, B. D.	93.7	67.2
33.8	39.5	23.4	11.8	80.4	82.8	85.7	73.0

side bust views of these men have been published already with the men of Taytay¹ to illustrate the Iberian type.

Absence of the Primitive is noteworthy at Cainta, and there is no modified Primitive or any form resembling them except the Blend. A few Australoid and Alpine types are seen and these with the Blends indicate to some extent the Filipino mixture.

Enough has been given to demonstrate the similarity of the Cainta men to the European, and to the East Indian. Their presence proves that such people came to the Philippines, and the presence of similar types throughout the Islands indicates an Indian influence. This has been no inconsiderable factor in the peopling of the Philippines and explains the great prevalence of the Iberian throughout the archipelago. In support of this view, the recent work of Salceby² concerning the Hindu influence previous to the more recent Spanish occupation and before the Moro or Mohammedan invasion of the Islands, is worth noting.

¹ *This Journal*, Sec. 1. (1909), 4, 359.

² *Studies in Moro History, Law and Religion. Ethnol. Surv. Pub. Manila* (1905), 4, Part I.

ILLUSTRATIONS.

PLATE I. East Indians of Cainta.

- FIG. 1. (38) Iberian Type C.
2 (14) Iberian Type A.
3. (18) Iberian Type D.



FIG. 1 (No. 38).



FIG. 2 (No. 19).



FIG. 3 (No. 16).

PLATE I.

BORKENKÄFER DER PHILIPPINEN.

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ERSTE SERIE.

Über die Borkenkäfer-Fauna der Philippinen ist bisher sehr wenig bekannt geworden. Eichhoff beschreibt in seiner Monographie zwei dortige Arten respective eine davon Varietät: *Xyleborus kraatzii* var. *philippinensis*,¹ und *Coccotrypes pygmaeus*.² Eichh. Eine weitere von den Philippinen bekannte Art ist: *Xyleborus capito* Schauf.³ Hagedorn erwähnt das Vorkommen von *Eurydactylus scirpinosus* Motsch. auf Luzon.⁴ Fast ebenso unbedeutend wie die Zahl der von den Philippinen bekannten Ipsiden (Scolytiden) ist diejenige der Platypodiden. Chapuis nennt nur vier Arten:⁵ *Crossotarsus lecontei* Chap., *Platypus selaceus* Chap., *Pl. turbatus* Chap. und *Pl. lepidus* Chap. Eine fünfte Art: *Pl. philippinensis*⁶ fügte später Blandford hinzu.

Auf Grund des Studiums der Borkenkäfer aus der staatlichen Sammlung in Manila bin ich in der Lage weitere Beiträge zur Kenntnis dieser forst- und landwirtschaftlich schädlichen Insekten zu liefern und zwar nicht nur auf rein systematischem, sondern auch auf biologischem Gebiete.

Unter den nachfolgend aufgeführten zwölf Borkenkäferarten sind zehn neu für diese Inselgruppe, fünf hiervon waren bisher überhaupt noch nicht beschrieben.

¹ Eichhoff, Ratio, descriptio, emendatio Tomiceinorum (1875), 374.

² Loc. cit. (1879), 310.

³ Schauffuss, Tijdschr. voor Ent. (1897), 40, 215.

⁴ Deutsche Ent. Ztschr. (1908), 377.

⁵ Chapuis, Monographie des Platypides (1868).

⁶ Trans. Ent. Soc. London (1896), 193.

IPIDÆ (Scolytidæ).

I. PILIDENTATÆ.⁷

PHLÆOTRUPINÆ.

DACTYLIPALPUS Chapuis.

Dactylipalpus transversus Chapuis.

Dactylipalpus quadratocollis Chapuis, Synops. des Scolyt., Mem. Soc. Roy. Sci. Liège (1869), 12; Strohmeier, Entomol. Blätter (1909), Heft. 12.

MINDORO, Rio Baco, P. I. (3388, R. C. McGregor).

Diese Art war bisher nur bekannt von Malacca, Ternate, Celebes und Sumatra. *D. quadratocollis* Chap. ziehe ich als Synonym zu *D. transversus* nachdem ich durch Untersuchung der Geschlechtsorgane auch bei afrikanischen *Dactylipalpus*-Arten festgestellt habe, das der Quereindruck auf dem Halsschild ein s. g. sekundärer Geschlechtscharakter des Weibchens und kein Artkennzeichen ist. Die weiteren von Chapuis bei *quadratocollis* genannten Unterscheidungsmerkmale; geringere Grösse und mehr quadratisches Halsschild sind nur Eigentümlichkeiten der schmälern und meist kleineren Männchen.⁸

II. SPINIDENTATÆ.⁷

HYLESINIDÆ.

SPHÆROTRYPES Blandford.

Sphærotrypes philippinensis sp. nov.

Brevissime ovatus, piceus vel nigropiceus, antennis tarsisque dilutionibus rufescentibus; capite nigropiceo, vertice in fundo subtilissime reticulato haud dense sed fortiter punctato; fronte plana rugose punctata, squamulis flavis ac pilis parvis sat dense adpersa, supra os plerumque carinula longitudinali brevi laevi; prothorace sat nitido valde transverso, anterie fortiter angustato, basi postice acutius producta, ad latera evidenter marginato, post apicem constricto, in fundo subtilissime reticulato haud dense punctato punctis magnis squamiferis irregulariter dispositis, praesertim antice brevissime tomentoso et pilis singulis flavis adperso, linea mediana plus minusve obsoleta; elytris prothorace latio-

⁷ Haged., Ent. Blätter (1909), 5, 163.

⁸ Zu vergl. meine Arbeit in den Entomologischen Blättern, Jahrg. 1909, Heft 12: "Beschreibung zweier neuer *Phloxoborus*-Arten und Ergänzung der Diagnosen einiger bekannter *Phloxoborus*-Arten unter Berücksichtigung der sekundären Geschlechtscharaktere."

ribus, striato-punctatis, punctis rotundis distantibus, striis basin versus angustatis et ante marginem anteriorem abbreviatis, interstitiis striis multo latoribus elevatis, ante marginem basalem valde dilatatis, et transverse rugosis, fortiter et irregulariter punctatis punctis squamiferis, praesertim in disco tuberculis majoribus uniseriatim dispositis et antice in carinulam plus minusve confluentibus; abdomine subtus fortiter ac dense punctato.

Longitudo 3.2–3.5 mm.; latitudo prothoracis 1.9–2.1 mm.; latitudo elytrorum 2.1–2.3 mm.

MINDANAO, Zamboanga, P. I. (W. I. Hutchinson legit).

Futterpflanze: Yacal (*Hopea*).

1 Type No. 8849 in der Entomologischen Sammlung des Bureau of Science, Manila, P. I.

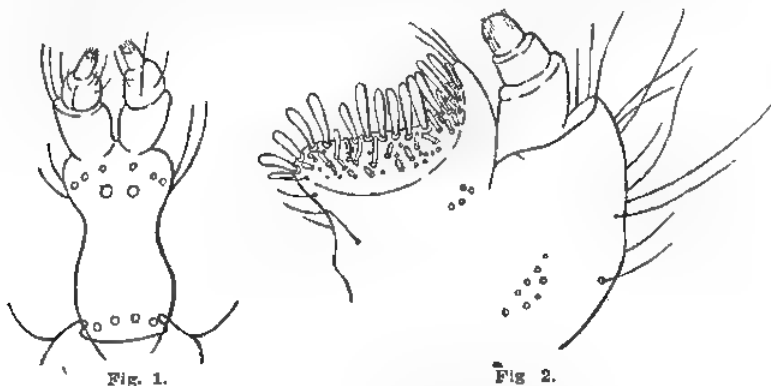
1 Paratype in meiner Sammlung.

Kurz eiförmig, heller oder dunkler pechbraun mit etwas helleren mehr rötlich-braunen Antennen und Tarsen; Kopf dunkel pechfarben, Scheitel auf chagriniertem Grunde kräftig aber nicht sehr dicht punktiert; Stirn flach, grob punktiert, ziemlich dicht mit gelblichen Schuppen und kleinen Haaren besetzt, über den Mundteilen mit einem zuweilen fehlenden kurzen und glattem Längskiele; Prothorax mässig glänzend, breiter als lang, nach vorn stark verschmälert und vor der Spitze eingeschnürt, an der Basis hinten in der Mitte mit vorgezogener Spitze, an den Seiten deutlich gerandet auf fein chagriniertem Grunde ungleich und mässig dicht punktiert, die schuppentragenden Punkte gross und nur flach eingedrückt, besonders der vordere Teil des Halsschildes oben kurz und dicht behaart mit einzelnen zwischenstehenden längeren Borsten, die Mittellinie ziemlich undeutlich und bei den einzelnen Exemplaren ungleich ausgebildet; Flügeldecken etwas breiter als das Halsschild, in deutlich ausgeprägten Streifen punktiert, die Punktstreifen vor der etwas wulstigen Basis sehr verschmälert und abgekürzt, die Zwischenräume zwischen den Streifen breiter als die Punktstreifen, vor der Basis mehr oder weniger miteinander verschmelzend, gewölbt und unregelmässig punktiert mit schuppentragenden Punkten, hauptsächlich auf der Scheibe mit je einer Reihe weitläufig gestellter Tuberkeln welche nach der Basis hin mehr oder weniger zu einer Leiste zusammenfliessen, die verbreiterten Teile der Zwischenräume an der Basis quer gerunzelt; Abdomen auf der Unterseite stark und dicht punktiert.

In Fig. 1 und 2 sind Mentum und Maxillen abgebildet.

Von *Spharotrypes siwalikensis* Stebbing unterscheidet sich diese Art unter Anderem durch das Fehlen des hinteren Quereindrucks auf dem Halsschilde, von *Sph. coimbatorensis* Stebbing durch die Sculptur des Prothorax und von *Sph. pila* und *globulus* Blandford durch die Beschaffenheit der Flügeldecken. Das glattere und nur mässig dicht punktierte

Halsschild schliesst auch eine Verwechslung dieser Art mit *Sphaerotrypes tanguus* Schauffuss, *blandfordi* Schauffuss und *barlatus* Hagedorn aus.



FIGS. 1 und 2.—*Sphaerotrypes philippinensis* Strohmeyer.
Mentum, palpi labiales et maxillae. 80 X vergrössert.

Gefangen wurden die mir vorliegenden Exemplare von *Sphaerotrypes philippinensis* m. an Yakal, einem Hartholze der Gattung *Hopea*.

Die Frassfigur (Tafel I) besteht aus einem einarmigen Lotgange ohne Rammelkammer (nuptial chamber) und zahlreichen sich nicht kreuzenden Larvengängen. Der Muttergang, welcher meist oben an der Spitze mehr oder weniger nach einer Seite gekrümmt ist, hat eine Länge von 3.5 bis 4.5 cm.⁹ Die Eigruben, in welche die Eier einzeln abgelegt werden, sind äusserst dicht aneinander gereiht. Die verhältnismässig kurzen und breiten Larvengänge fallen dadurch auf, dass sie sehr früh an Breite zunehmen, eine Tatsache, die auf ein sehr rasches Wachstum deutet. Die Puppenwiegen liegen am Ende der Larvengänge, welche in Spint und Rinde ungefähr gleich tief einschneiden.

Nach Stebbings Abbildung zu urteilen sind die Muttergänge von *Sphaerotrypes siwalikensis* Stebbing¹⁰ kürzer und die Eigruben weniger dicht aneinander gedrängt. Letztgenannter Käfer lebt an *Shorea robusta*.

CRYPTHALINÆ.

CRYPTHALUS Erichson.

Cryphalus squamulosus sp. nov.

Elongatus, fere cylindricus, pallide flavescens, prothorace anteriori et capite rufescentibus; oculis reniformibus antice emarginatis; vertice subtilissime rugoso fere laevi; fronte subplana dense rugoso-punctata; prothorace semi-elliptico latitudine vix brevior, lateribus a basi ad mediam partem rectis parallelis, dein ad apicem fortiter rotundatis, angulis posticis subrotundatis, supra medio subgibbo, margine anteriori unise-

⁹ Nach den mir vorliegenden 4 Frassfiguren.

¹⁰ Departmental Notes on Insects that affect Forestry, E. P. Stebbing, Calcutta (1902), pl. XXIII.

riatim tuberculato, disco antice tuberculis transversis compressis valde infuscatis subconcentrice ordinatis, ad basim et latera subgranulate punctato, antice pilis, postice squamulis albidis adperso; elytris subcylindricis, latitudine multo longioribus, striato-punctatis, punctis magnis, striis haud impressis, interstitiis planis, vix perspicue uniseriatim punctatis, punctis minimis, multo magis distantibus quam in striis, squamulis ac pilis albidis uniseriatim dispositis.

Long. 1.36 mm., lat. 0.53 mm., prothoracis longitudo: 0.50 mm.; prothoracis latitudo: 0.53 mm.; elytrorum longitudo: 0.86 mm.; elytrorum latitudo: 0.53 mm.

MINDORO, Calapan, P. I. (*J. L. Webb* legit).

Type No. 1420 in der Entomologischen Sammlung des Bureau of Science, Manila, P. I.

1 Cotype in meiner Sammlung.

Lang gestreckt, fast cylinderförmig, blass gelb, Kopf und vorderer Teil des Prothorax rötlichgelb; Augen vorn ausgerandet; Scheitel äusserst fein gerunzelt, fast glatt; Stirn wenig gewölbt, fast flach, dicht und grob punktiert; Halsschild etwas kürzer als breit, die Seiten von der Basis bis über die Mitte hinaus gerade und parallel, hierauf bis zur Spitze stark gerundet, die Hinterecken nur wenig abgerundet, oben in der Mitte stark erhöht, am Vorderrande mit einer Reihe von Tuberkeln, vorn auf der Scheibe mit zahlreichen quergestellten schmalen Höckern, welche fast in concentrischen Kreisen angeordnet sind, nach der Basis hin und auf den Seiten körnig punktiert, vorne mit Haaren, nach hinten mit einzelnen blass-gelben Schuppen bedeckt. Die Flügeldecken fast cylinderförmig, viel länger als breit, in Reihen gross punktiert, die Zwischenräume flach und äusserst fein einreihig punktiert, die Punkte viel weiter auseinanderstehend als in den Punktstreifen, zwischen den Streifen abwechselnd Reihen von Schuppen und Haaren.



FIG. 3.—*Cryphalus squamulosus* Strohmerer. Antenna. 12 X vergrössert.

Auffallend gross ist bei diesem *Cryphalus* das erste Glied der Fühlergeissel, (funiculus) (Fig. 3). Wegen der ausgerandeten Augen gehört der Käfer in die erste der von Eichhoff gebildeten *Cryphalus*-Gruppen.

IPINÆ.

COCCOTRYPES Eichhoff.

Coccotrypes graniceps Eichhoff.

Coccotrypes graniceps Eichhoff, Ratio, descriptio, emendatio Tomicinorum (1873), 314.

NEGROS, Maso, P. I. (1400, *Charles S. Banks*).

Futterpflanze: Cacao (*Theobroma cacao* Linn.)

Ein Exemplar in meiner Sammlung.

Halsschild schliesst auch eine Verwechslung dieser Art mit *Sphaerotrypes tanguus* Schauffuss, *blandfordi* Schauffuss und *barbatus* Hagedorn aus.

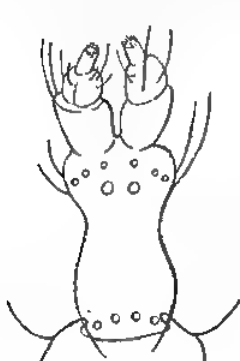


Fig. 1.

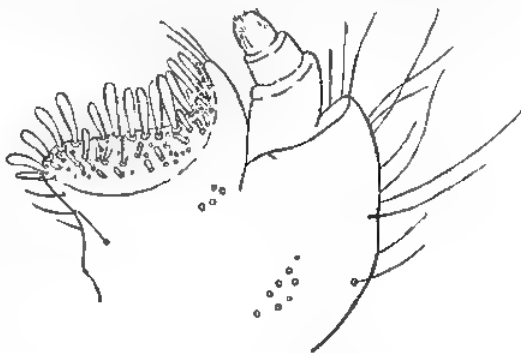


Fig. 2.

FIGS. 1 und 2.—*Sphaerotrypes philippinensis* Strohmeyer
Mentum, palpi labiales et maxillae. 80 X vergrößert.

Gefangen wurden die mir vorliegenden Exemplare von *Sphaerotrypes philippinensis* n. an Yaka, einem Hartholze der Gattung *Hopca*.

Die Frassfigur (Tafel I) besteht aus einem einarmigen Lotgange ohne Rammelkammer (nuptial chamber) und zahlreichen sich nicht kreuzenden Larvengängen. Der Muttergang, welcher meist oben an der Spitze mehr oder weniger nach einer Seite gekrümmt ist, hat eine Länge von 3.5 bis 4.5 cm.⁹ Die Eigruben, in welche die Eier einzeln abgelegt werden, sind äusserst dicht aneinander gereiht. Die verhältnismässig kurzen und breiten Larvengänge fallen dadurch auf, dass sie sehr früh an Breite zunehmen, eine Tatsache, die auf ein sehr rasches Wachstum deutet. Die Puppenwiegen liegen am Ende der Larvengänge, welche in Splint und Rinde ungefähr gleich tief einschneiden.

Nach Stebbings Abbildung zu urteilen sind die Muttergänge von *Sphaerotrypes siratikiensis* Stebbing¹⁰ kürzer und die Eigruben weniger dicht aneinander gedrängt. Letztgenannter Käfer lebt an *Shorea robusta*.

CRYPTHALINÆ.

CRYPTHALUS Erichson.

Cryptalus squamulosus sp. nov.

Elongatus, fere cylindricus, pallide flavescens, prothorace anteriori et capite rufescentibus; oculis reniformibus antice emarginatis; vertice subtilissime rugoso fere laevi; fronte subplana dense rugoso-punctata; prothorace semi-elliptico latitudine vix brevior, lateribus a basi ad mediam partem rectis parallelis, dein ad apicem fortiter rotundatis, angulis posticis subrotundatis, supra medio subgibbo, margine anteriori unise-

⁹ Nach den mir vorliegenden 4 Frassfiguren.

¹⁰ Departmental Notes on Insects that affect Forestry, E. P. Stebbing, Calcutta (1902), pl. XXIII.

riatim tuberculato, disco antice tuberculis transversis compressis valde infuscatis subconcentricis ordinatis, ad basim et latera sulgranulate punctato, antice pilis, postice squamulis albidis adperso; elytris subcylindricis, latitudine multo longioribus, striato-punctatis, punctis magnis, striis haud impressis, intersitiis planis, vix perspicue uniseriatim punctatis, punctis minimis, multo magis distantibus quam in striis, squamulis ac pilis albidis uniseriatim dispositis.

Long. 1.36 mm., lat. 0.53 mm.; prothoracis longitudo: 0.50 mm.; prothoracis latitudo: 0.53 mm.; elytrorum longitudo: 0.86 mm.; elytrorum latitudo: 0.53 mm.

MINDORO, Calapan, P. I. (*J. L. Webb* legit).

Type No. 1420 in der Entomologischen Sammlung des Bureau of Science, Manila, P. I.

1 Cotype in meiner Sammlung.

Lang gestreckt, fast cylinderförmig, blass gelb, Kopf und vorderer Teil des Prothorax rötlichgelb; Augen vorn ausgerandet; Scheitel äusserst fein gerunzelt, fast glatt; Stirn wenig gewölbt, fast flach, dicht und grob punktiert; Halsschild etwas kürzer als breit, die Seiten von der Basis bis über die Mitte hinaus gerade und parallel, hierauf bis zur Spitze stark gerundet, die Hinterecken nur wenig abgerundet, oben in der Mitte stark erhöht, am Vorderrande mit einer Reihe von Tuberkeln, vorn auf der Scheibe mit zahlreichen quergestellten schmalen Höckerchen, welche fast in concentrischen Kreisen angeordnet sind, nach der Basis hin und auf den Seiten körnig punktiert, vorne mit Haaren, nach hinten mit einzelnen blass-gelben Schuppen bedeckt. Die Flügeldecken fast cylinderförmig, viel länger als breit, in Reihen gross punktiert, die Zwischenräume flach und äusserst fein einreihig punktiert, die Punkte viel weiter auseinanderstehend als in den Punktstreifen, zwischen den Streifen abwechselnd Reihen von Schuppen und Haaren.



FIG. 3—*Cryphalus squamulosus* Strohmeyer. Antenna. 12 × vergrössert.

Auffallend gross ist bei diesem *Cryphalus* das erste Glied der Fühlergeissel, (funiculus) (Fig 3). Wegen der ausgerandeten Augen gehört der Käfer in die erste der von Eichhoff gebildeten *Cryphalus*-Gruppen.

IPINÆ.

COCCOTRYPES Eichhoff.

Coccotrypes graniceps Eichhoff.

Coccotrypes graniceps Eichhoff, Ratio, descriptio, emendatio Tomicinorum (1878), 314.

NEGROS, Maao, P. I. (1400, *Charles S. Banks*).

Futterpflanze: Cacao (*Theobroma cacao* Linn.)

Ein Exemplar in meiner Sammlung.

Eichhoff's Beschreibung passt sehr gut auf beide Exemplare nur fehlt den mir vorliegenden die kleine Stirnleiste. Dieses Merkmal ist aber bei vielen Borkenkäferarten sehr wenig constant, manchmal auch nur das schlechtskennzeichen, jedenfalls genügt es nicht um diese Exemplare als eine andere Art anzusehen.

Bisher war dieser Käfer nur in Japan gefunden worden.

OZOPEMON Hagedorn.¹¹

Ozopemon laevis sp. nov.

Femina: oblonga, cylindrica, nitida, parce pilosa, flava, prothorace anteriore et capite flavo-ferruginea, elytris antice flavis, postice flavo-ferrugineis, irregulariter infuscatis; vertice tenuissime strigoso-punctato, linea mediana, valde infuscata; fronte antice leviter impressa, fortiter punctata, punctis magnis, linea mediana elevata, angusta non infusca. prothorace fere globoso, latitudine vix brevior, lateribus leviter apice fortiter rotundato, angulis porticeis rotundatis, dorso convexo subglobo, anterieus et in lateribus tuberculis vel rugis transversis infuscatis, subconcentricis ordinatis scabrato, postice in disco evidenter sat dense punctato; elytris cylindricis, prothorace vix latioribus et illo prope duplo longioribus, humeris rotundatis, lateribus longe ultra medium parallelis, dein fortiter conjunctim rotundatis, striato-punctatis, punctis sat magnis et confertis, striis antice haud postice obsolete impressis, interstitiis fere planis, laevibus, uniseriatim punctatis punctis minoribus quam in striis et magnis distantibus, apice retuso plano, interstitiis uniseriatim tuberculatis, tuberculis piliferis; abdomine subius punctato et sparsim aequaliter pilosa.

Long. 4.1 mm., latitudo maxima 1.7 mm.; prothoracis longitudo 1.4 mm., latitudo 1.6 mm.; elytrorum longitudo 2.7 mm., latitudo 1.7 mm.

MINDORO, Calapan, P. I. (*J. L. Webb* legit).

Type ♀ No. 1421 in der Entomologischen Sammlung des Bureau of Science, Manila, P. I.

Paratype, ♀, in meiner Sammlung.

Weibchen. Länglich, cylindrisch, glänzend, dünn behaart, gelb, vorderer Teil des Halsschildes und Kopf rötlichgelb, Flügeldecken an der Basis gelb, nach hinten rötlichgelb mit unregelmässig verteilten dunkleren Trübungen, Scheitel sehr fein gestichelt punktiert, mit brauner Mittellinie; Stirn vorn leicht eingedrückt, stark punktiert, mit sehr schmaler etwas erhöhter Mittellinie; Halsschild fast kugelig, etwas breiter als lang, an den Seiten leicht, an der Spitze stark gerundet, nach vorn etwas verschmälert, Hinterecken stark gerundet, oben stark convex, vorn und auf den Seiten mit dunkleren quergestellten schmalen Körnchen, die fast in concentrischen Kreisen angeordnet sind, hinten auf der Scheibe deutlich und ziemlich dicht punktiert; Flügeldecken cylindrisch, wenig breiter

¹¹ *Deutsche Ent. Ztschr.* (1908), 382, und dieselbe *Ztschr.* (1910), I, 2 und 3; Fig. 43a, 1. m.

als das Halsschild und fast doppelt so lang als dieses, Schultern gerundet, Seiten weit über die Mitte parallel, dann nach hinten stark gerundet, in Streifen punktiert, die Punkte ziemlich gross und dicht aneinandergereiht, die Streifen nur nach hinten leicht vertieft, die Zwischenräume fast eben und je mit einer Punktreihe versehen, die Punkte kleiner und weitläufiger als in den Streifen. Absturz abgeflacht, die Zwischenräume hier je mit einer haartragenden Körnchenreihe; Abdomen unterseits punktiert und dünn gleichmässig behaart.



FIG. 4.—*Ozopemon laevis* Strohmer. Antenna (scapus et funiculus).

Dieser Käfer gehört einer äusserst interessanten Gattung an, über deren Lebensweise noch gar nichts bekannt ist. Die Maxillarbewaffnung (s. Abb.) welche aus breiten sichel-förmigen Dornen besteht, deutet jedoch darauf hin, dass wir es mit einem Bastbewohner und keinem technisch schädlichen Holz-Insekte zu tun haben, trotzdem die äussere Form sehr an *Xyleborus*-Arten erinnert, zumal das Halsschild ziemlich deutlich gebuckelt ist.



FIG. 5.—*Ozopemon laevis* Strohmer
Mentum
(palpi labiales et ligula).

***Ozopemon major* sp. nov.**

Oblongus, cylindricus, nitidus, parce pilosus, nigropiceus, prothorace, capite, antennis pedibusque rufescentibus; fronte nitida, obsolete punctata, antice leviter impressa; prothorace latitudine vix brevior, lateribus, fere rectis, apice fortiter, rotundato, angulis posticis subrectis vix rotundatis, dorso convexo subgibbo, anterie et in lateribus tuberculis vel rugis transversis subconcentricis ordinatis scabrato. postice subtilissime parce punctato, nitido; elytris cylindricis, prothorace vix latioribus et illo prope duplo longioribus, humeris rotundatis, lateribus fere usque ad apicem parallelis, dein fortiter conjunctim rotundatis, striato-punctatis, punctis parvis non confertis, striis hand impressis, interstitiis latis planis laevibus alternatim irregulariter uni vel biserialiter parcius punctatis, punctis minoribus et multo magis quam in striis distantibus; declivitate postica subtruncato-retusa, convexiuscula, ambitu postice acutius marginato, interstitiis uniserialiter tuberculatis, tuberculis aureo setosis.



FIG. 6. *Ozopemon laevis* Strohmer Maxilla.

Longitudo 6.0 mm.; longitudo thoracis 2.1 mm.

Luzon, Bataan, Limay, P. I. (*R. J. Alvarez* legit).

Type No. 12007 in der Entomologischen Sammlung des Bureau of Science, Manila, P. I.

Paratype in meiner Sammlung.

Langgestreckt, cylinderförmig, glänzend, wenig behaart, dunkel pechfarben; Halsschild, Kopf, Antennen und Beine rötlich-braun. Stirn

glänzend undeutlich punktiert mit einem wenig vertieften Längseindrucke in der Mitte; Halsschild kaum kürzer als lang, Seiten fast gerade, vorn stark gerundet, Hinterecken fast rechtwinkelig, wenig abgerundet, oben stark convex, in der Mitte etwas gebukelt, auf der vorderen Hälfte und auf den Seiten quengerunzelt, die Erhöhungen beinahe in concentrischen Kreisen angeordnet, hinten glatt sehr sparsam und fein punktiert, glänzend; Flügeldecken cylinderförmig, kaum breiter als das Halsschild aber fast doppelt so lang, die Schultern gerundet, die Seiten weit über die Mitte parallel, alsdann gemeinsam gerundet, in Streifen punktiert, die Punkte klein und nicht sehr dicht gestellt die Streifen nicht vertieft, die Zwischenräume breit, eben, glatt, abwechselnd unregelmässig ein- und zweireihig punktiert mit äusserst feinen weit getrennt stehenden Punkten; Flügeldecken-Absturz ziemlich abschüssig, wenig gewölbt, nach hinten ziemlich scharf gerandet, die Zwischenräume hier mit je einer Reihe goldgelbe Haare tragenden Körnchen.

Diese *Ozopemon* Art ist die grösste unter allen bisher beschriebenen und ähnelt bei oberflächlicher Betrachtung in der Form sehr einem *Bostrychiden* aus der Gattung *Sinoxylon*.

Bisher sind nur die folgenden Arten dieser Gattung bekannt geworden:

1. *Ozopemon rugatus* Blandford (Sarawak, Borneo).
2. *Ozopemon sumatranus* Blandford (Sumatra, Mt. Singalang).
3. *Ozopemon gravidus* Blandford (Sarawak, Borneo).
4. *Ozopemon regius* Hagedorn (Sumatra).
5. *Ozopemon theklæ* Hagedorn (Sumatra).
 var. *sirameanus* Hagedorn (Si-Rambé, Sumatra).
 var. *singalangicus* Hagedorn (Mt. Singalang, Sumatra).
6. *Ozopemon obanus* Hagedorn (Mentawai Inseln).
7. *Ozopemon fuscicollis* Hagedorn (Java u. Sumatra).
8. *Ozopemon laevis* Strohmeyer (Mindoro, Philippinen).
9. *Ozopemon major* Strohmeyer (Luzon, Philippinen).

III. SETIDENTATÆ.¹²

XYLEBORINÆ.

XYLEBORUS Eichhoff.

Xyleborus perforans Wollaston.

Tomicus perforans Woll., Cat. Col. Mad. (1854), 96; Col. Hesperid. (1867), 113

Xyleborus kraatzii Eichh., Berl. Ent. Ztschr. (1868), 152; Ratio Tomicinorum (1878), 374; Blandford, W. F. H., Report on the destruction of bear casks in India, London, 1893.

NEGROS, Maao, P. I. (416 Charles S. Banks).

Ein ♀ in meiner Sammlung.

Beide Exemplare gehören der kleinen Form des *X. perforans* an,

¹² Haged. Ent. Blätter (1909), 5, 163.

welche Eichhoff noch von der grösseren Form *affinis* trennte. Als Fundorte dieser Varietät waren bisher bekannt: Madeira, Indien, Ceylon, Andamanen, Tonkin, Siam, Malayische Region, Jamaika, Amazonas, Seennellen, Madagaskar, Ost-Africa und die Insel Principe. In meiner Sammlung befinden sich ausserdem Exemplare von den Cap Verde Inseln, Upolu (Samoa Ins.) sowie den Aroe- und Key-Inseln.

Xyleborus perforans var. *philippinensis* Eichh.

Xyleborus kraatzii var. *philippinensis* Eichhoff, *Ratio Tomicinorum* (1879), 343.

Xyleborus perforans var. *philippinensis* Eichhoff; Blandford, Report on the destruction of beer casks in India by the attacks of a boring beetle (*Xyleborus perforans* Woll.) London (1893), 12 u. 46 (Appendix).

Luzon, Laguna, Magdalena, P. I. (No. 410 W. Schultz) 1 ♀ in meiner Sammlung.

Futterpflanze: Cocosnuss (*Cocos nucifera* Linn.)

Diese Käfer unterscheiden sich von den typischen *X. perforans* Woll. (*X. kraatzii* Eichh.) durch ihre bedeutendere Grösse, dunklere, bräunliche, Färbung und die auffallend groben Punktstreifen auf den Flügeldecken. Auch sind die Streifen neben der Naht sehr deutlich vertieft. Ich halte es noch für sehr zweifelhaft ob dieser Käfer nur eine Varietät des *perforans* ist, die Entscheidung dieser Frage bei einem Vertreter dieser äusserst schwer zu bestimmenden *Xyleborus*-Gruppe muss verschoben werden bis mehr Material vorliegt.

Sobald mehr Exemplare dieser Art besonders auch Männchen, vorliegen, wird sich feststellen lassen, ob wir nur eine Varietät des *perforans* oder eine gute Art vor uns haben.

Subgenus *Eurydactylus* Hagedorn.

Eurydactylus sexspinosus Motschulsky.

Eccoptyerus sexspinosus Motsch., Bull. Moscou (1863), 36, 515.

Xyleborus abnormis Eichhoff, Berl. Ent. Ztschr. (1868), 282.

Xyleborus abnormis Eichhoff, Ratio Tomicinorum (1879), 343.

Platydictylus abnormis Eichhoff, Notes Leyd. Mus. (1898), 8, p. 25.

Platydictylus sexspinosus Motsch., Blandford Indian Mus. Notes (1893), 3, 65.

Eurydactylus sexspinosus Motsch., Hagedorn, Deutsche Ent. Ztschr. (1909), 733.

Negros, Mailum, P. I. (6498, Charles S. Banks).

Ein Exemplar in meiner Sammlung.

Als Fundorte waren bisher bekannt: Ceylon, Indien, Java, Sumatra, Philippinen (Luzon), für die Varietät *E. multispinosus* Hagedorn: Kamerun.¹³ In meiner Sammlung habe ich ein Exemplar von *sexspinosus* aus Deutsch-Ost-Afrika: Hagedorn sah diesen Käfer auch in Zanzibar-Kopal. Als Nährpflanzen sind bis jetzt bekannt: Reis, Kakao und Kaffeebaum.

¹³ Deutsche Ent. Ztschr. (1908), 377.

PLATYPODIDÆ.

CROSSOTARSUS Chapuis.

Gruppe: CROSSOTARSI GENUINI Chapuis.

Crossotarsus comatus Chapuis.

Crossotarsus comatus Chapuis, Monographie des Platypides (1865), 59, fig. 5.¹⁴

NEGROS, Maao, P. I. (417 *Charles S. Banks*).

Ein ♀ in meiner Sammlung.

Diese Art war bisher nur aus Celebes bekannt (*Chapuis*).

PLATYPUS Herbst.

Gruppe: PLATYPI SULCATI Chapuis.

Platypus jansoni Chapuis.

Platypus jansoni Chapuis, Monographie des Platypides (1865), 244, fig. 146

NEGROS, Maao, P. I. (413 *Charles S. Banks*).

Ein ♂ in meiner Sammlung.

Eichhoff kannte diese Art von Neu-Guinea, den Molukken und von Celebes.

Gruppe: PLATYPI CUPULATI Chapuis.

Phatypus schultzei sp. nov.

Mas: elongatus angustus, ferrugineo testaceus elytris apice infuscatis; vertice fortiter punctato punctis majoribus, linea mediana laevi infusca; fronte rugose punctata, stria mediana parva impressa; prothorace nitido sparsim irregulariter punctato, linea mediana in postica parte, congeriebus punctorum duabus minimis ad latera lineae medianae; elytris evidenter striato-punctatis, stria suturali sulcata, interstitiis laevibus uniseriatim irregulariter punctatis punctis multo minoribus quam in stria, depressione postica circulari, inferne emarginata, emarginationis margine dente obtuso armato, angulo suturali obtuso.

Longitudo: 4.0 mm.

Fem: flavescens, fronte rugose punctata, linea mediana parva; prothorace sat dense punctulata, in postica parte congeriebus punctorum duabus magnis semi-ovalibus ad latera lineae medianae; elytris striato-punctatis, punctis parvis obsolete impressis, stria suturae proxima impressa, interstitiis sparsim uniseriatim punctulatis punctis minimis.

Longitudo: 4.4 mm.

NEGROS, Maao, P. I. (*Charles S. Banks* legit).

Typen 1 ♂ u. 1 ♀ No. 1594 in der Entomologischen Sammlung des Bureau of Science, Manila, P. I.

¹⁴ Bekanntlich hat Chapuis die ♂ ♂ u. ♀ ♀ der Platypodiden durchgängig verwechselt; fig. 5 stellt deshalb nicht wie angegeben das ♀ sondern das ♂ dar.

Paratypen 1 ♂ u. 1 ♀ in meiner Sammlung.

Männchen. Langgestreckt, schmal, rötlichgelb, die Flügeldecken nach hinten dunkler; Scheitel stark und grob punktiert mit glatter dunkler Mittellinie; Stirn grob punktiert, mit kurzem strichförmigem Eindruck in der Mitte; Halsschild glänzend unregelmässig sparsam punktiert, hinten mit glatter Mittellinie, an den Seiten dieser Linie je ein kleiner aus wenigen (circa 8–10) deutlichen Punkten gebildeter Flecken; Flügeldecken mit deutlichen Punkstreifen, die beiden neben der Naht liegenden Streifen vertieft, die Zwischenräume glatt unregelmässig einreihig punktiert, die Punkte viel kleiner als diejenigen in den Streifen; der tiefe Eindruck am Flügeldecken-Absturz kreisförmig, innen ausgeschnitten und am Rande mit stumpfen Zähne jederseits versehen, Suturalecken der Flügeldecken stumpfwinkelig.

Weibchen. Blass gelblich; die Stirn grob punktiert, die Mittellinie kurz; Halsschild ziemlich dicht fein punktiert, hinten neben der Mittellinie je ein grosser halbovaler Punktflecken, bestehend aus sehr zahlreichen äusserst kleinen Punkten; die Flügeldecken mit Punkstreifen, die Punkte kleiner als beim ♂ und wenig vertieft, die Suturalstreifen vertieft, die Zwischenräume sparsam einreihig fein punktiert.

Diese Art gehört in die Nähe von *Platypus lepidus* Chapuis und *Pl. caliculus* Chap.; unterscheidet sich jedoch von beiden Arten leicht durch die Form des Ausschnittes am Flügeldecken-Absturze (Fig. 7 u. 8).

In meiner Sammlung befinden sich genau gleiche Exemplare von der Insel Sumatra.



FIG. 7.—*Platypus schultzei* Strohmeyer. *Depressio et marginatio postica*. 15 X vergrössert.



FIG. 8.—*Platypus lepidus* Chapuis. *Depressio et marginatio postica*. 15 X vergrössert.

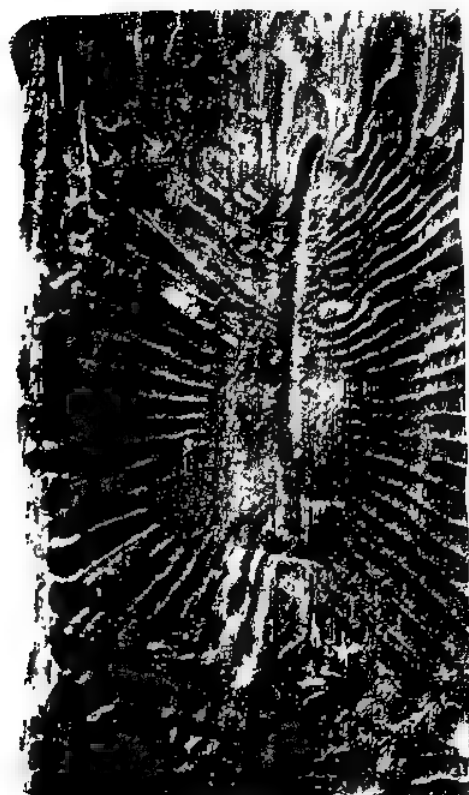
ILLUSTRATIONEN.

TAFEL I.

Yakal-Rinde mit Frasslgur von *Spharotrypes philippinensis* Strohmeier.

TEXTFIGUREN.

- FIG. 1 und 2. *Spharotrypes philippinensis* Strohmeier. Mentura, palpi labiales et maxillae. 80× vergrößert.
3. *Cryphalus squamulosus* Strohmeier. Antenna. 125× vergrößert.
- 4-6. *Ozopemon laccis* Strohmeier.
4. Antenna (scapus et funiculus).
5. Mentum (palpi labiales et ligula).
6. Maxilla.
7. *Platypus schultzei* Strohmeier. Depressio et marginatio postica. 15× vergrößert.
8. *Platypus lepidus* Chapuis. Depressio et marginatio postica. 15× vergrößert.



TAFEL I.

NOTES ON THE DIGESTIVE SYSTEM OF HYDROCORAX.

By HOLTON C. CURL,

(Surgeon, United States Navy.)

Because of their peculiar appearance and strange habits, the hornbills have always been of popular and scientific interest, and a very large number of articles have been written about them.

Their method of nesting, mode of flight, and gross anatomy have been abundantly described, while some fairly good accounts of their habits have been given.¹

In order to try to learn something regarding the periodical casting-off of the lining of the stomach, as described first by Bartlett,² I have recently made a series of histological sections of the various parts of the gastro-intestinal tract of *Hydrocorax hydrocorax* (Linnaeus), and find facts of sufficient interest to record.

The best results are obtained by taking small portions of tissue from a recently collected bird and placing them in a 10 per cent aqueous formalin solution for eighteen hours; from this, the tissue is transferred to 70 per cent alcohol, where it is kept until ready to use.

Within a few days one may embed the tissues in paraffin, cut moderately thin sections, and stain by the Van Gieson or by the hematoxylin and eosin method. The Van Gieson stain has the very desirable quality of giving a perfect differentiation. Muscle stains yellow, connective tissue stains red, and colloid tissue stains orange.

By this stain, the muscular coat can readily be separated from the mucous and serous coats, while by its nuclear staining the cells are well-defined and add to the clearness of the picture.

Before giving a description of the sections, I wish to call attention to several statements, found in standard books, regarding hornbills and which I do not find to correspond with my examinations and observations of *Hydrocorax hydrocorax*. For example, Newton³ says that the "horn-

¹ Newton, Dictionary of Birds, London (1893), 432-437.

² Proc. Zool. Soc. London (1869), 142-146.

³ Loc. cit.

bill, at least in captivity, never has any fat about him." The species mentioned is often found to be extremely fat and it takes a long time to remove the thick layer from the skin, while the abdomen contains fat in quantities. In other specimens collected under similar conditions, very little fat is present. Again, the statement that the large hornbills make so much noise when flying that they "can be heard a mile," does not apply to the bird mentioned.

The most important thing which my findings tend to show to be in error, is regarding the muscular layers of the intestine. Authorities make the general statement that the circular layer of the intestine is found *external* to the *longitudinal* layer, as in the oesophagus. This is true in some birds, but in many it is by no means so. In *Hydrocorax*, in *Æthiopsar*, in *Anas*, and in *Bubulcus*, the Van Gieson stain shows clearly that the intestine has an *outer longitudinal* layer of muscle in contact with the peritoneum; next, internal to this, a *circular layer* and still more internally, a thinner longitudinal layer, with some oblique fibers and intimately blended with the submucosa. This last layer of muscle corresponds very closely to the muscularis mucosæ in mammals and is sometimes so developed as to become a fairly thick longitudinal layer. These layers are shown very clearly in the photomicrograph of the intestine of *Hydrocorax hydrocorax*. Anyone familiar with histological technique can verify the above in the genera mentioned, and I dare say in many others by using a two-thirds inch objective for routine and one-sixth inch for occasional differentiating.

In the following descriptions of the parts of the alimentary tract, the measurements given are from alcoholic specimens, previously run through the 10 per cent formalin and are slightly less than those from fresh material. The oesophagus, proventriculus, stomach, and intestine are described and photomicrographs given to show the histology.

The oesophagus is 200 millimeters in length and will admit the thumb when fully dilated; at the lower end it becomes funnel-shaped and increases in size as it reaches the proventriculus. The mucous membrane is thrown into longitudinal corrugations which run unbroken for almost the entire length; these corrugations project further into the lumen in front than behind throughout the upper three-fourths; in the lower fourth, they are of about equal size on all sides. Dilatation of the oesophagus does not obliterate them and the best-developed ones measure 2 millimeters in height.

A cross section shows microscopically that there is an external, circular, muscular layer; next, an internal, longitudinal layer intimately connected with the mucosa, in fact projecting inward into the bases of the rugæ.

The mucous membrane being thrown into longitudinal corrugations, a cross section gives a circle of inward projections with connective tissue frame work, the usual blood vessels, and covered with epithelium. A layer of globular cells lies beneath the epithelium and each opens by a

short duct on the free surface of the membrane. The deeper cells of the epithelium show round nuclei; these become flatter toward the free inner surface, and at the surface they are almost as flat as those seen in the skin. Apparently only simple mucus for lubrication is secreted by the lining of the oesophagus. The photomicrograph shows the structures quite well.

The proventriculus is 30 millimeters in length and the wall is 8 millimeters thick in the thickest part, just above the sphincter muscle which lies between it and the stomach. The inner surface is thickly set with the mouths of glands and when examined in a recently collected bird, is covered with a thick coat of sticky, mucoid material. On section, an outer fibrous coat is seen; next a strong, circular, muscular layer; then a longitudinal, muscular layer on which rests a layer of glands beneath the mucosa. The glands of this layer are large, each is inclosed in a connective tissue capsule and, somewhat like a salivary gland, presents a radiating, tubular structure with a central space in which there are very few cells and which is filled with mucoid material. Each gland (or at least those of the inner layers), opens on the free surface of the mucous membrane by a wide mouth, which passes through the mucosa proper. They resemble "Brunner's" glands in that they lie *below* the muscularis mucosae. Internal to this glandular layer is the mucosa proper, of ordinary type, with villi projecting from the surface and with a network of muscle fibers, forming a *true, reticulate muscularis mucosae*.

It is evident that the glandular layer of the proventriculus is a highly specialized structure, undoubtedly supplying the essential digestive fluid for this part of the tract. This is the more certain when we remember that the tough, deciduous membrane of the stomach, about to be described, would effectively prevent any digestive fluid which might be secreted by the glands of the stomach from coming in contact with the food.

The stomach of this large hornbill when empty, is oval with flattened sides and varies in thickness from 2 millimeters on the membranous sides, to 11 millimeters where the muscle is thickest. The muscle fibers cross in a radiating manner from one tendinous disk to the similar disk on the other side, and are reinforced by numerous other fibers arising from the membranous, internal muscle-sheath. There is the usual modification of fibers at the cardiac and pyloric openings and at the cardiac opening a round, cord like, circular muscle, 5 millimeters in diameter, acts as a strong sphincter between the proventriculus and stomach. At the pyloric opening the sphincter is less well marked.

The entire lining of the stomach is corrugated and presents a brownish, irregular surface. On section this is seen to be due to the deciduous membrane which, depending on its stage of development, is more or less loosely attached to the stomach proper. The cardiac and pyloric openings are but 15 millimeters apart. As the entire organ when empty

is 50 millimeters in diameter, and when filled with food twice as large, it can readily be seen that when the lining membrane is cast off

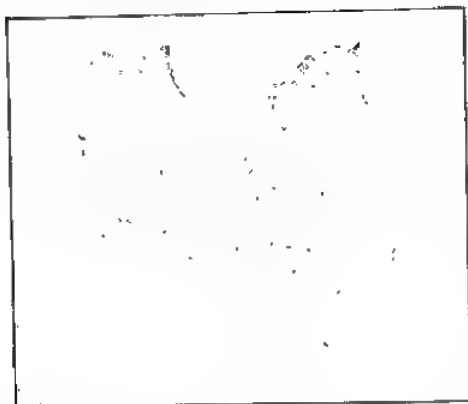


FIG. 1.—Stomach of *Hydrocorax hydrocorax* showing. A, deciduous membrane almost ready to be cast off (note its separation); B, stomach before the preparatory separation has taken place.

entire, it forms a sac with the two openings close together at the top.

In a stomach where the sac-like lining is about to be cast off, it separates from the entire surface of the stomach before its upper, neck-like portion separates finally around the pyloric opening, at which point it thins down rapidly and disappears just above the sphincter muscle. On the other hand, in a specimen where the lining membrane is in an earlier stage of formation (i. e., soon after the last one has been cast off),

no macroscopical separation can be demonstrated, although microscopically the line of future separation is well seen.

On section the stomach is found to have an external serous coat, a thick muscular coat, and a mucous lining. There is nothing peculiar about the serous and muscular layers. The mucous membrane shows closely studded, long, finger-like villi which have tubular glands at their bases and are covered by a single layer of cells with large nuclei.

When the deciduous membrane is just beginning to form, the spaces between the villi are filled with colloid-appearing material which stains a bright orange-yellow by the Van Gieson method. A little later this layer becomes thicker and lies as a continuous coat over the entire inside of the stomach. Before it is ready to be thrown off, it becomes in fact, thicker than the mucosa itself. The deciduous membrane is of homogeneous structure, is quite tough, and on its mucous-membrane side is an accurate cast of the rugae of the stomach. It seems certain that this layer, which is so peculiarly cast off, is formed by secretion from the glands of the stomach and after reaching its full thickness, separates spontaneously, leaving the glands to begin at once the formation of a new sac.

The intestine is from 920 to 950 millimeters in length and, having no caecum, is not clearly divisible into large and small portions except possibly by its structure when examined from within. The mucous

membrane of the upper three-fourths has a velvet-like feel and shows long villi lying close together. At a point about 250 millimeters from the rectum and about where one would expect to find the caeca, if such did exist, there is a short section of the gut which is dilated, has thin walls, and an entirely different type of villi. This section is about 70 millimeters in length, and below it one again finds villi of the same type as occur in the upper intestine.

The intestine differs from the oesophagus in the position of the muscular layers. A section shows externally the serous coat, made up of connective tissue; next to this a well-developed longitudinal muscular coat; next, internal to this, the circular muscular layer. The muscularis mucosae lies internal to this circular layer and then comes the mucosa with its epithelial lining. This is shown perfectly in the cross-section of the gut where the outer longitudinal fibers are seen cut across and the circular fibers are seen in their circular plane. Simple alveolar glands lie at the base of the villi.

After this brief description of the digestive tract, the following points appear worth considering: I have collected three large hornbills at practically the same time, months after the breeding season was over, and found the deciduous membrane in three different stages of development; one was separated entirely from the stomach except for a narrow zone around the cardiac opening, one was just beginning to form, and the third was in an intermediate stage. At other seasons the same has been found and in some, the sac, ready to be cast off, was packed full of indigestible parts of the fruit on which the birds were feeding. It seems reasonable to suppose that, at least when the breeding season is past, the food, mixed with, and acted upon by, the secretion of the pro-ventricular glands, passes into the deciduous sac lining the stomach; here muscular action completes the mixing, triturates the food, and prepares the digestible parts to pass over into the duodenum. The refuse is then periodically ejected in the membranous sac. Whether this routine is changed at the breeding season, I can not say.

Another point of interest is the abrupt change in the character of the mucous membrane in the short section of the gut at about the point one would expect to find caeca; this, together with the dilatation and thinning of the intestinal wall at this point may suggest the explanation of the absence of caeca in certain species where the diet is similar to that of others in which these organs are present. Is it not possible that the mucous membrane of the gut itself takes on, in these specialized areas, the functions performed by the caeca in other birds? In *Bubulcus* for example, where the bud-like, single caecum is very short, the mucous membrane of the adjacent gut contains numerous masses of lymphoid tissue, from 90 to 250 millimeters in diameter, not found in other parts

of the intestine, but found in the caecal bud itself. As we know, in many animals where there is no appendix, the head of the caecum contains a great increase of lymphoid tissue.

Numerous interesting superstitions and beliefs concerning the *calao*, or great Philippine hornbill, are found among the natives and are worth collecting, while a systematic and accurate study of the bird's habits would well repay the observer.

ILLUSTRATIONS.

PLATE I.

FIG. 1. Cross section of œsophagus of *Hydrocorax hydrocorax*.

2. Longitudinal section of proventriculus of *Hydrocorax hydrocorax*: A, Mucous membrane; B, muscularis mucosae; C, specialized glands; D, muscular coats.

PLATE II.

FIG. 3. Section of stomach of *Hydrocorax hydrocorax*: A, Deciduous membrane; B, mucosa; C, muscular coats; D, peritoneum.

4. Cross section of intestine of *Hydrocorax hydrocorax*: A, Peritoneum; B, longitudinal layer of muscle; C, circular layer of muscle; D, muscularis mucosae beneath the mucosa.

TEXT FIGURE.

FIG. 1. Stomach of *Hydrocorax hydrocorax* showing: A, deciduous membrane almost ready to be cast off (note its separation); B, stomach before the preparatory separation has taken place.

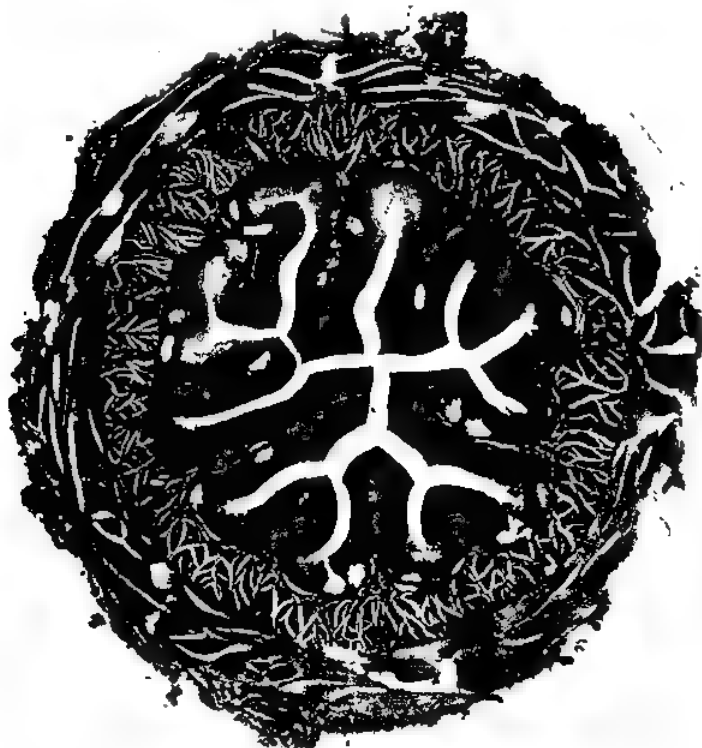


FIG. 1.



FIG. 2.

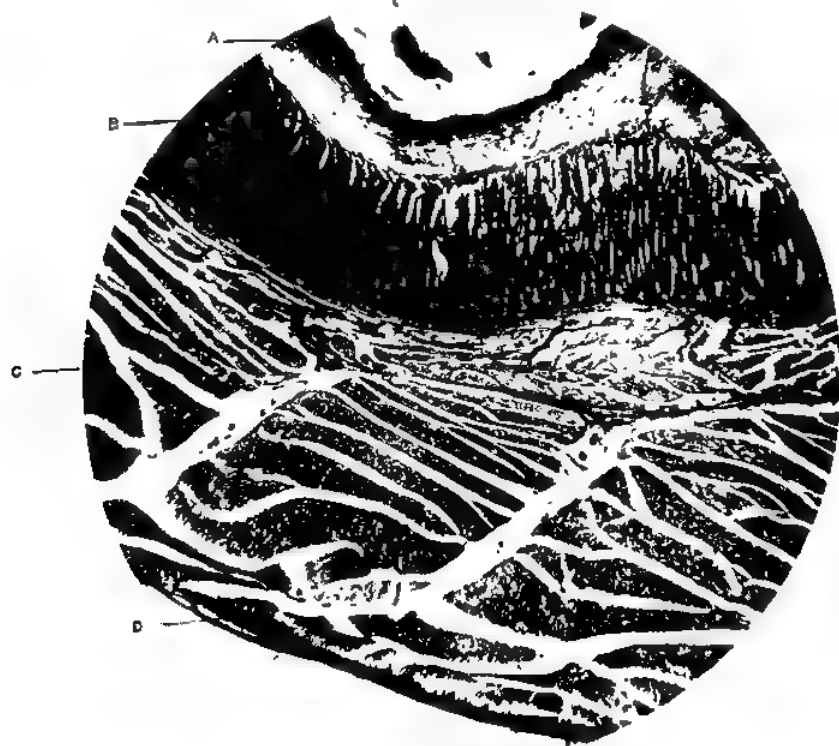


FIG. 3.

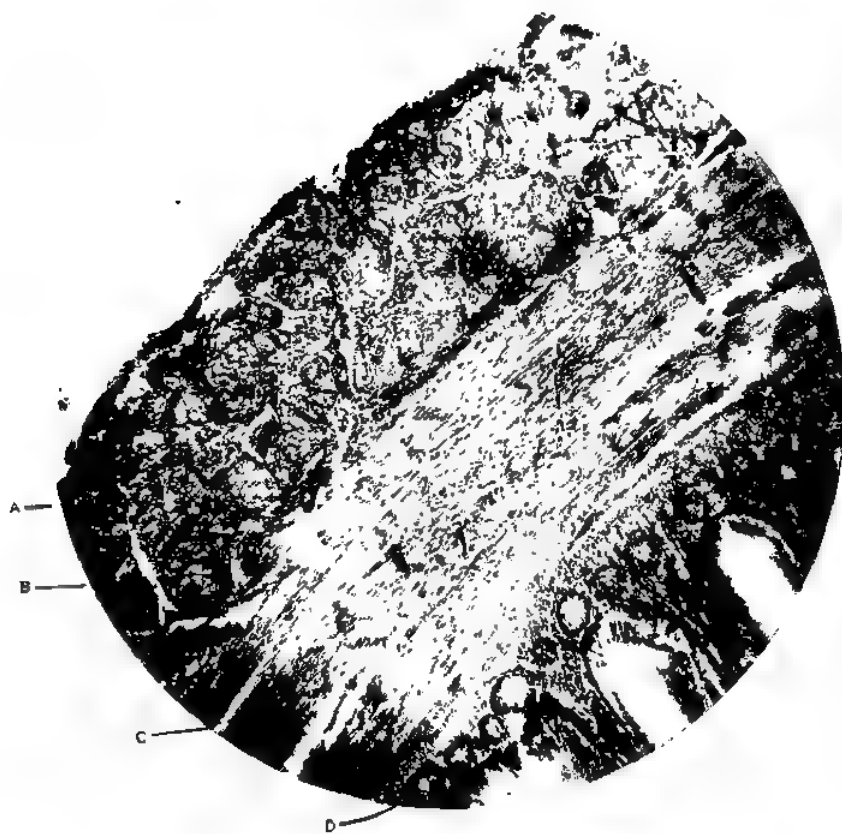


FIG. 4.

NOTES ON A COLLECTION OF BIRDS FROM NORTHERN NEGROS.

By RICHARD C. MCGREGOR.

(From the Ornithological Section, Biological Laboratory, Bureau of Science,
Manila, P. I.)

The earliest paper on the birds of Negros that I have seen is one by Walden and Layard¹ on a collection made in the southern part of the island by Mr. L. C. Layard. Of the seventeen species there recorded three are described as new. In 1875 Walden published his monograph, "A List of the Birds Known to Inhabit the Philippine Archipelago,"² including therein some species obtained in Negros by the German collector Meyer, and giving the total number of species known from the island as thirty eight. Two years later, Mr. A. H. Everett began his explorations in the Philippine Islands which resulted in the discovery of the many new species of Philippine birds described and figured by Tweeddale in the Proceedings of the Zoological Society of London, 1877-1879. Everett³ collected at Valencia and Dumaguete in the southern part of the island and secured specimens of fifty-six species; twenty-four of these had not previously been recorded from Negros and six of them had not been known from the Philippines. *Dasyrotopha speciosa*, the most remarkable of the three new species discovered by Everett, was described and figured in a separate paper.⁴

In 1874 Steere began his work in the Philippine Islands, visiting Negros during the next year, where he obtained specimens of thirty eight species of birds, among them being the following new species which were described by Sharpe.⁵

Oriolus steeri, *Dicaeum leucostictum*, *Ethopyga magnifica*, *Antheptes chlorigaster*, and *Phapitreron nigrorum*.

As a result of the collections made by the Steere Expedition,⁶ eighty-one species were recorded from Negros. Two species, *Cryptolopha*

¹ *Ibis* (1872), 93-107, pls. 4-6.

² *Trans. Zool. Soc. London* (1875), 9, 125-252 23-34.

³ *Proc. Zool. Soc. London* (1878), 280-288.

⁴ *Proc. Zool. Soc. London* (1878), 114, pl. 9.

⁵ *Nature* (1876), 14, 207, 298; *Trans. Linn. Soc. London*, 2d. ser. Zool. (1877), 307-353, pls. 40-54.

⁶ A list of the birds and mammals collected by the Steere Expedition to the Philippines, Ann Arbor, 1890.

nigrorum and *Abornis olivacea*, collected by the Steere Expedition were described and figured by Moseley.⁷

Bourne and Worcester⁸ added twenty four species to the Negros list and described the following as new: *Phapitreron maculipectus*, *Batrachostomus menagei*, *Ceryx nigrirostris*, *Oriolus nigrostriatus* (— *sturi*), *Ethopyga bonita*, *Hyloterpe winchelli*, and *Rhinomyias albicularis*.

Grant's⁹ report on Whitehead's collection includes notes on eighty-six species, three being described as new: *Turdus nigrorum*, *Brachypteryx brunneiceps*, and *Cittocinclia nigrorum*.

In 1894 Clarke began a series of papers based upon birds collected in Negros by W. A. Keay.¹⁰ In these papers eighty-six species are recorded and one new species, *Phlogoenas keayi*, is described and figured.

In February and March, 1909, Mr. Andres Celestino made collections in the vicinity of Cadiz, northern Negros, and the species obtained by him are listed in the present paper. The following species are believed to be here recorded from this island for the first time: *Astur trivirgatus*, *Tachornis pallidior*, *Cyanomyias caestis*, and *Ethopyga bonita*.

LIST OF SPECIES.

TRERONIDÆ.

Osmotreron axillaris (Bonaparte).

One female.

Phapitreron maculipectus Bourne and Worcester.

The collection contains nine specimens of this rare dove. The collector gives the length as 280 to 292 millimeters; eyes brown; bill black; feet red; nails brown.

Measurements of *Phapitreron maculipectus*

Sex.	Wing.	Tail.	Culmen from base.	Tarsus.
	mm.	mm.	mm.	mm.
Male.....	145	118	21	21
Do.....	143	120	23	20
Do.....	145	118	24.5	20
Do.....	141	114	27	18
Do.....	147	120	24	19
Female.....	149	119	23	19
Do.....	140	112	23	18
Do.....	147	115	22	18
Do. ^a	137	102	22	19

^a This specimen is in poor plumage.

⁷ *Ibis* (1891), 46, 47, pl. 2.

⁸ *Minnesota Acad. Nat. Sci. Occ. Papers* (1894), 1, 1-64.

⁹ *Ibis* (1896), 325-365.

¹⁰ *Ibis* (1894), 532-535, Second Contribution, *Ibid.* (1895), 473-479; Part III, *Ibid.* (1898), 119-124; Part IV, *Ibid.* (1900), 351-361, pl. 8.

Phapitreron nigrorum Sharpe.

Three males and one female.

Leucotreron occipitalis (Bonaparte).

Two males in fine, adult plumage. This yellow-breasted fruit pigeon was taken in Negros by Whitehead also.

Muscadivores chalybura (Bonaparte).

One specimen.

Zonophaps poliocephala (Hartlaub).

One pair in fine adult plumage.

COLUMBIDÆ.**Columba griseogularis** (Walden and Layard).

Two females. Some individuals of this species from Batan, Batanes, have the bills considerably longer than the Negros examples, but the difference is not constant.

ARDEIDÆ.**Bubulcus coromandus** (Boddaert).

One female in winter plumage.

FALCONIDÆ.**Astur trivirgatus** (Temminck).

One specimen, an immature male. This species has not, so far, been recorded from Negros.

Spilornis panayensis Steere.

One adult male in good plumage.

PSITTACIDÆ.**Prioniturus discurus** (Vieillot).

A pair, taken February 24, and a female, taken March 10, are in fine plumage.

Tanygnathus lucionensis (Linnaeus).

Two adult males; in one specimen the blue of the crown and nape is unusually dark.

Loriculus regulus Sournacé.

One male and three females of the central island colasisi were collected; the male is in immature plumage.

ALCEDINIDÆ.**Ceyx bournsi** Steere.

The only specimen, a female, of Bourns's kingfisher in this collection has a considerable quantity of black mixed with the deep blue of the upper surface.

Halcyon moseleyi (Storer).

One female specimen of this very rare kingfisher was collected on February 19. Wing, 108 millimeters; tail, 86; culmen from base, 46; tarsus, 15. Length, taken by the collector, 265 millimeters.

BUCEROTIDÆ.

Penelopides panini (Boddaert).

One pair of the Panay variety.

Craniorrhinus waldeni Sharpe.

Three males and two females of Walden's hornbill, all in good plumage.

HEMIPROCNIIDÆ.

Hemiprocne major (Hartert).

One male specimen; wing, 141 millimeters.

MICROPODIDÆ.

Tachornis pallidior McGregor.

One specimen, without sex mark, was collected on March 10. This is the first record of the species.

CUCULIDÆ.

Surniculus velutinus Sharpe.

In an adult female from Cadiz most of the rectrices are conspicuously bordered with white and several of the longer upper tail-coverts are faintly tipped with the same color. This species was taken in Negros by Whitehead also.

Hierococcyx sparveroides (Vigors).

Two males in adult plumage.

Cacomantis merulinus (Scopoli).

One male specimen.

CAPITONIDÆ.

Xantholæma roseum (Dumont).

Two specimens, male and female.

PICIDÆ.

Yungipicus maculatus (Scopoli).

Four males and one female were taken in February.

Chrysocolaptes xanthocephalus Walden and Layard.

One male and one female in good plumage.

Thriponax hargitti Sharpe.

Thriponax hargitti Clarke, Ibis (1895), 475-477; McGregor, Man. Phil. Bds. (1908), 1, 400.

This collection contains three males and four females of Hargitt's black woodpecker; all of them are in good plumage and well prepared.

In five specimens there is a wide, buffy white band across the rump, in one male the white band is narrow, and in one female most of the back and uropygium are bare. The lower mandible in all these Negros specimens is whitish. The Masbate and Negros birds appear to be of the same species and they must be called *T. hargitti* unless Steere's *T. philippinensis* can be shown to be distinct from the *Thriponax* of Palawan.

PITTIDÆ.

Pitta erythrogastra Temminck.

One female.

HIRUNDINIDÆ.

Hirundo rustica Linnæus.

One female swallow, taken March 17, differs from the other specimens from Negros in having the pectoral band continuous across the fore breast and in having the white of the under surface distinctly washed with pale ochraceous-pink.

Hirundo gutturalis Scopoli.

One female and two male swallows, March 17, are of the eastern species.

MUSCICAPIDÆ.

Cyanomyias cælestis (Tweeddale).

The celestial-blue flycatcher is represented in the present collection by an adult female. There appears to be no previous record of this species for Negros.

Rhipidura albiventris (Sharpe).

Three specimens of the white-bellied fantail.

Xeocephus rufus (Gray).

Two males and one female.

Cryptolopha olivacea (Moseley).

Two specimens of the olivaceous flycatcher warbler.

CAMPOPHAGIDÆ.

Artamides panayensis Steere.

Two males and one female.

Edolisoma panayense Steere.

This very distinct and handsome cuckoo shrike is represented in the present collection by eight males and six females.

PYCNONOTIDÆ.

Iole guimarasensis Steere.

Two males and one female.

TIMELIIDÆ.

Dasycrotapha speciosa Tweeddale.

The type of this curious species was collected by A. H. Everett at Valencia in southern Negros and was described and figured by Tweeddale in the Proceedings of the Zoölogical Society of London for 1878. Other specimens were secured in Negros by the Steere Expedition and by the Menage Expedition. The collection now under consideration contains a series of seven males and one female. The sexes appear to be similar in color. The structure of the feathers is very similar to that found in the various species of *Mixornis* and *Macronous*, but the feathers of the lower back are not noticeably lengthened, while the orange-colored feathers above and behind the eyes are stiff and harsh. The length of specimens in the flesh, as given by the collector, is from 145 to 150 millimeters.

Measurements of four males and one female are given herewith.

Measurements of Dasycrotapha speciosa.

Sex	Wing.		Tail.	Culmen from base.	Bill from nostril.	Tarsus.
	mm.	mm.		mm.	mm.	mm.
Male	67	66		16	10.5	18.5
Do	70	68.5		17	11	19
Do	68	56		17	11	18
Do	68	59		16	11	17
Female	65	63		15	10	18

TURDIDÆ.

Kittacincla superciliaris Bourns and Worcester.

Cittocincla nigrorum Grant, Ibis (1896), 547.

Upon comparison of an adult male shama from Negros with adult males from Ticao and Masbate, the characters given for *Cittocincla nigrorum* do not appear to be valid. In the first place the superciliary stripe in all three species is practically of the same width. In *K. luzonensis* alone the stripes are connected across the forehead. This species is also distinguished by the rusty brown rump, large white spots on rectrices, and other characters. In *K. superciliaris* the spots on the rectrices are much reduced or may be altogether obliterated. The length of tarsus in the original description of *K. superciliaris* is clearly a mistake.

A specimen from Cadiz, Negros, marked female, differs from the male as follows: The superciliary stripes are continued forward above the lores to the base of bill; the upper parts are less glossy; the chin and throat are white and there is a narrow band of black across the chest.

Measurements of *Kittacincta*.

Species.	Sex.	Wing.	Tail.	Culmen from base.	Tarsus.
		mm.	mm.	mm.	mm.
<i>K. luconensis</i>	Male	82	82	18	26
<i>K. superciliosa</i>	do	89	78	19	26
Do	do	83	74	19.5	27
Do	do	79	66	18	25
<i>K. n. grora</i>	do	78	71	17	27
Do	Female	74	67	17.5	26.5

Pratincola caprata (Linnaeus).

One male and one female.

SYLVIIDÆ.

Megalurus tweeddalei McGregor.

One specimen.

LANIIDÆ.

Hyloterpe winchelli Bourns and Worcester.

Three males and two females.

PARIDÆ.

Pardaliparus elegans (Lesson).

One male, March 19, and one female, January 29, from Cadiz, do not differ from specimens taken in Bataan Province, Luzon.

SITTIDÆ.

Callisitta oenochlamys (Sharpe).

One male and two females.

CERTHIIDÆ.

Rhabdornis mystacalis (Temminck).

A male, the only specimen of *Rhabdornis* in the present collection, differs from specimens taken in Luzon in having the bill conspicuously longer, the feet larger, and the color of the back and rump darker. If additional specimens from Negros show that these characters are constant, the species may be known as *Rhabdornis longirostris*.

ZOSTEROPIDÆ.

Zosterops nigrorum Tweeddale.

Two specimens; one of these is slightly albinistic, having five rectrices white, washed with pale yellowish green.

I have long suspected that a series of birds of this genus, collected by me on the little island of Cresta de Gallo, represented a distinct species. With topotypes of *Zosterops nigrorum* at hand I still hesitate to separate the Cresta de Gallo individuals as a species, although in the latter the wing, tail, and bill average longer and the color of the upper parts is more uniform and more yellowish.

Measurements of Zosterops nigrorum.

Locality.	Wing.	Tail.	Cul- men from base.	Tarsus.
	mm.	mm.	mm.	mm.
Negros.....	54	42	12.5	15
Do.....	55	38	12	14
Masbate.....	52	36.5	13	15.5
Ticao.....	56	38	13	15
Cresta de Gallo.....	58	41	14	17
Do.....	58	44	14	18
Do.....	57.5	43	13.5	17
Do.....	56.5	43	14.5	16

DICAËIDÆ.

Dicaeum haematostictum Sharpe.

Three males and two females.

Dicaeum dorsale Sharpe.

Four males and one female in fresh plumage.

NECTARINIIDÆ.

Æthopyga magnifica Sharpe.

One adult male; the types of this species were collected in Negros.

Æthopyga bonita Bourns and Worcester.

Two full-plumaged males from Negros differ in no way from a male from Ticao and a male from Cebu. This appears to be the first record of the Visayan sunbird from the Island of Negros.

Cinnyris guimarasensis Steere.

One male and two females of this species were taken in March.

MOTACILIIDÆ.

Anthus rufulus (Vieillot).

One specimen, January 29.

PLOCEIDÆ.

Munia jagori Martens.

Two specimens.

Uroloncha everetti (Tweeddale).

One specimen, February 4.

ORIOLIDÆ.

Oriolus steerii Sharpe.

Thirteen males and six females.

DICRURIDÆ.

Dicrurus mirabilis Walden and Layard.

Two males.

ON A QUINARY NOTATION AMONG THE ILONGOTS OF NORTHERN LUZON.

By OTTO SCUTTER.

Within the area of Austronesian languages there are represented, in a pure or in a modified form, all those systems of numeration which are designated as quinary, decimal, or vigesimal notations; according as they are based upon the counting of the digits of only one hand, of both hands, or of both hands and feet.

From the Philippines in particular none but decimal systems have hitherto been recorded, not excepting such tribes as the Negritos, Tagbanwas and similar people of low culture.¹

In view of this general use of decimal series of numerals in the Philippines it will be of interest here to make known a case of quinary notation in northern Luzon as found by me some time ago in an old Egongot (i. e., Ilongot) catechism dating from 1792, and declared by its authors, three Spanish missionaries, to be a revision of a still older text.²

As is to be supposed, the catechism does not give the Egongot numerals by way of demonstration. They occur in the text mostly in the form of ordinals in such places as "The ten commandments," "The articles of faith," and the like. Collecting these ordinals I obtain the following list:

<i>Ta anbuoua</i>	the first	<i>Ta catambiang no siyet</i>	the sixth
<i>Ta catua</i>	the second	<i>Ta catambiang no dua</i>	the seventh
<i>Ta catgo</i>	the third	<i>Ta catambiang notga</i>	the eighth
<i>Ta caupat</i>	the fourth	<i>Ta catambiang no apat</i>	the ninth
<i>Ta catambiang</i>	the fifth	<i>Ta catampopoo</i>	the tenth

¹ For a full treatise on the numerals of these systems see the praiseworthy paper of Professor Frank R. Blake in *Journ. Am. Or. Soc.* (1907), 28: Contributions to Comparative Philippine Grammar, Part II.

² "Catecismo de doctrina cristiana en Egongot, escrito por el M. R. P. Fray Francisco de la Zarza, O. S. F. Dado á luz por Fernando Blumentritt, . . . y aumentado por el mismo editor con equivalencias del texto egongot ó ilongote en castellano, tagalog y moro de Maguindanao." (Vienna, 1893). As will be shown, the form "Egongot" for "Ilongot" represents an idiomatic pronunciation of this word among at least that section of the Ilongots whose dialect is used in this catechism. For this reason it is employed by me in this paper as a term distinctive for that dialect.

Ta, appearing before each of these numerals, is an Egongot demonstrative particle acting as article.

Onbucoug is the equivalent, not of "one," but of "first." The word occurs, in this or related forms, in several other passages. There is evidently a typographical confusion between "u" and "a." Compare—

Na mucong toi Dios Ama, ta Dios Anac, at ta Spiritu Santo?

Is first (superior) the God Father to God Son and to Ghost Holy?

Auan-a namucoug, auan-a naonod de, ten sisiet ta enca Dios de.

There is not being first, there is not following behind among them, for only one the Godship their.*

Ca in *cadua*, *catgo*, etc., is a prefix making ordinals from cardinals, not only in Egongot but in several other dialects of Luzon.

Eliminating these three factors from the above list, and observing the composition of the numerals from "six" to "ten," we have all the necessary material for establishing the following list of Egongot cardinals:

Eng-lish.	Egongot.	Pangasinan.	Eng-lish.	Egongot	Pangasinan.
one	<i>siyet</i> (<i>siet</i>)	<i>isa</i>	six	<i>tambiang na siyet</i>	<i>anim</i>
two	<i>dua</i>	<i>dua</i>	seven	<i>tambiang na dua</i>	<i>pito</i>
three	<i>tego</i>	<i>talo</i>	eight	<i>tambiang notga</i>	<i>walto</i>
four	<i>apat</i>	<i>apat</i>	nine	<i>tambiang na apat</i>	<i>sina</i>
five	<i>tambiang</i>	<i>lima</i>	ten	<i>tampo</i> (<i>tampoo</i>)	<i>siampala</i> (<i>samplo</i>)

The cardinals *tego*, *tambiang*, and *tampo* (*tampoo*) occur as such repeatedly in the text; *siet* was quoted above in its restrictive form *sisiet*. For comparison with a series of typical Philippine numerals the corresponding Pangasinan cardinals have been added.

"One" is expressed in Egongot by a word, *siet* or *siyet*, which, compared with Pangasinan as well as with any other Philippine dialect, shows hardly any affinity, at least not *prima facie*.

From "two" to "four" Egongot uses numerals which, though varying in form, are the common property of all these dialects. The characteristic variation in the case of the numeral "three" in Egongot is the change from general Philippine *l* or *d* to *g*. The same change, typical for Egongot, is seen in such other words as *gema*, "hand" (Tagalog *lima*), *gabe*, "male" (Tag. *lalaki*), *uge*, "again," "anew" (Tag. *uli*), etc. It is this sound-change which accounts also for the form "Egongot" instead of "Ilongot," the change from *i* to *e* being the ordinary fluctuation of these vowels.

"Five" is expressed, not by *lima*, in which all Philippine dialects agree, and which, as we have just seen, would be here *gema*, but by the idiomatic term *tambiang*, formed of a prefix *tam* (cf. *tampo*) before a stem, *biang*.

* *Op. cit.*, p. 19.

From "six" to "nine" the Egongot numerals are clearly seen to express "five and one," "five and two," "five and three," and "five and four," which shows that, once "five" is reached by counting the fingers of one hand, the count is begun anew. That the particle *no* is the equivalent of "and," is proved by a phrase of the text: *dit bucolot no nauquin bininiaguen*, "the pagans and bad Christians,"⁴

The numeral for "ten" is *tampo*, evidently with long *o* (compare the variant *tampoo*). It consists of the prefix *tang*, which also appears in *tambiāng*, changed to *tam-* by the influence of the labial that follows, and stem *po* or *poo*, which is the common Philippine *polo* or *pulo* with elision of *l*.

For the two numerals "one" and "five," in Egongot we find no immediate correspondent among the forms of the equivalent numerals in the generality of the other dialects. But apart from these two words we have as characteristic of this series of Egongot numerals that it is based on a clearly quinary plan, and that the words used are for the greater part the common property of a family of languages which, as far as it is represented in the Philippines, uses none but decimal systems. Similar cases of quinary series we find in Formosa.⁵

It remains to be pointed out that, although the Egongot plan is quinary, as far as I have been able to illustrate it above, it is only imperfectly so. If it were purely quinary the numeral for "ten," instead of being expressed by a distinct word, would be given by such a term as "five-five" or "two-fives." Again, beyond "ten," the advance would be by fives, not by tens. But this is a question not to be decided from the text before me, which lacks examples of higher numerals. I may, however, add that there exists a variant of the Egongot speech here illustrated, the speakers of which use a purely decimal series from "one" to "ten," and it may be believed that this will ultimately supersede the quinary series. For the present it must suffice that evidence has been given here of the existence in the Philippines of a representative of the quinary notation which is generally assumed to be a more primitive form of counting than the decimal system.

⁴ *Op. cit.*, p. 27.

⁵ Cf. the numerals given under 'Pep. Paz.' and 'Shek. T.' in Table I of The Batak Dialect as a Member of the Philippine Group of Languages. *Division of Ethnology Publications*, Manila (1908), 5, pt. I.

REVIEW.

The Provinces of China, Together with a History of the First Year of H. I. M. Hsuan Tung, and an Account of the Government of China. Reprinted from "The National Review" (China) as "The National Review Annual," 1910. Pp. 188. Cloth. Shanghai: "The National Review" Office, 1910.

Those among the millions of otherwise well-informed dwellers in Europe and America who plead guilty to the charge of ignorance of matters Chinese, brought against them by Colonel Bruce in his preface to this work, would indeed seem to have reason to be grateful to the publishers for their effort to dispel a part, at least, of that ignorance by offering here a fairly concise survey of the essentials and potentials of each of the provinces of China.

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The work is in the main a compilation of data collected from the best available sources; i. e., partly from official publications, such as the Customs Reports, and partly from works like those of Richthofen, Little, Hossie, and others. It should prove useful to those who look upon China as a field for the extension of their commercial or industrial activity. In any case, the reader, before opening the book, will do well to make up his mind as to whether the interest he takes in matters Chinese is proof against every once in a while there being flung into his face, between the pages he is expected to read, a glaring advertisement of cement, cooking ranges, pianos, or other foreign commodity.

OTTO SCHEERER.

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